DCR-TRV38/TRV38E/TRV39

RMT-814

SERVICE MANUAL

LEVEL 1

Ver 1.0 2003. 02

Revision History

Photo : DCR-TRV38

US Model
Canadian Model
DCR-TRV38/TRV39
E Model
Hong Kong Model
Tourist Model
DCR-TRV38/TRV38E
Korea Model
DCR-TRV38
Chinese Model
DCR-TRV38E

Z MECHANISM

Link

SPECIFICATIONS | SELF DIAGNOSIS FUNCTION | ORNAMENTAL PARTS

- INSTRUCTION MANUAL is shown at the end of this document.

Mini DV Digital Video Cassette

DIGITAL VIDEO CAMERA RECORDER

SONY

COVER

Self Diagnosis Supported model

Digital Handycam

Network Handycam

InfoLITHIUM M SERIES

Cassette Memory

MEMORY STICK

SPECIFICATIONS

Video camera recorder

System

Video recording system
2 rotary heads
Helical scanning system
Audio recording system
Rotary heads, PCM system
Quantization: 12 bits (Fs 32 kHz, stereo 1, stereo 2), 16 bits (Fs 48 kHz, stereo)
Video signal
DCR-TRV38/TRV39:
NTSC color, EIA standards
DCR-TRV38E:
PAL colour, CCIR standards
Usable cassette
Mini DV cassette with the Mini DV mark printed
Tape speed
SP: Approx. 18.81 mm/s
LP: Approx. 12.56 mm/s
Recording/playback time (using cassette DVM60)
SP: 1 hour
LP: 1.5 hours
Fastforward/rewind time (using cassette DVM60)
Approx. 2 min. and 40 seconds
Viewfinder
Electric viewfinder (color)
Image device
3.8 mm (1/4.7 type) CCD (Charge Coupled Device)
Gross: Approx. 1 070 000 pixels
Effective (still):
Approx. 1 000 000 pixels
Effective (moving):
Approx. 690 000 pixels
Lens
Carl Zeiss Vario-Sonnar
Combined power zoom lens
Filter diameter: 30 mm (1 3/16 in)
10×(Optical), 120×(Digital)
F = 1.8 – 2.0
Focal length
3.7 – 37 mm (5/32 – 1 1/2 in.)
When converted to a 35 mm still camera
In CAMERA:
50 – 500 mm (2 – 19 3/4 in.)
In MEMORY:
42 – 420 mm (1 11/16 – 16 5/8 in.)
Color temperature
Auto, HOLD, INDOOR (3 200 K), OUTDOOR (5 800 K)
Minimum illumination
7 lx (lux) (F 1.8)
0 lx (lux) (in NightShot)*
* Objects unable to be seen due to the dark can be shot with infrared lighting.

Input/Output connectors

S video input/output
4-pin mini DIN
Luminance signal: 1 Vp-p, 75 Ω (ohms), unbalanced
DCR-TRV38/TRV39:
Chrominance signal: 0.286 Vp-p, 75 Ω (ohms), unbalanced
DCR-TRV38E:
Chrominance signal: 0.3 Vp-p, 75 Ω (ohms), unbalanced
Audio/Video input/output
AV MINI JACK, 1 Vp-p, 75 Ω (ohms), unbalanced
327 mV, (at output impedance more than 47 kΩ (kilohms))
Output impedance with less than 2.2 kΩ (kilohms)/Stereo minijack (ø 3.5 mm)
Input impedance more than 47 kΩ (kilohms)
DV input/output
4-pin connector
Headphone jack
Stereo minijack (ø 3.5 mm)
LANC jack
Stereo mini-minijack (ø 2.5 mm)
USB jack
DCR-TRV38/TRV38E:
mini-B
DCR-TRV39:
mini-AB
MIC jack
Minijack, 0.388 mV low impedance with 2.5 to 3.0 V DC, output impedance 6.8 k Ω(kilohms)
(ø 3.5 mm)
Stereo type

LCD screen

Picture
8.8 cm (3.5 type)
Total dot number
184 000 (840 × 220)

General

Power requirements
7.2 V (battery pack)
8.4 V (AC Adaptor)
Average power consumption (when using the battery pack)
During camera recording using LCD
DCR-TRV38/TRV38E: 4.3 W
DCR-TRV39: 4.4 W
Viewfinder
DCR-TRV38/TRV38E: 3.2 W
DCR-TRV39: 3.3 W
Operating temperature
0°C to 40°C (32°F to 104°F)
Storage temperature
–20°C to + 60°C
(–4°F to + 140°F)
Dimensions (approx.)
72 × 91 × 161 mm
(2 7/8 × 3 5/8 × 6 3/8 in.) (w/h/d)
Mass (approx.)
660 g (1 lb 7 oz)
main unit only
750 g (1 lb 10 oz)
including the rechargeable battery pack NP-FM30, cassette DVM60 and lens cap
Supplied accessories
See page 3.

AC Adaptor AC-L15A/L15B

Power requirements
100 – 240 V AC, 50/60 Hz
Current consumption
0.35 – 0.18 A
Power consumption
18 W
Output voltage
DC OUT: 8.4 V, 1.5 A
Operating temperature
0°C to 40°C (32°F to 104°F)
Storage temperature
–20°C to + 60°C
(–4°F to + 140°F)
Dimensions (approx.)
56 × 31 × 100 mm
(2 1/4 × 1 1/4 × 4 in.) (w/h/d)
excluding projecting parts
Mass (approx.)
190 g (6.7 oz)
excluding power cord

Rechargeable battery pack NP-FM30

Maximum output voltage
DC 8.4 V
Output voltage
DC 7.2 V
Capacity
5.0 Wh (700 mAh)
Dimensions (approx.)
38.2 × 20.5 × 55.6 mm
(1 9/16 × 13/16 × 2 1/4 in.)
(w/h/d)
Mass (approx.)
65 g (2.3 oz)
Type
Lithium ion

"Memory Stick"

Memory
Flash memory
8MB: MSA-8A
Operating voltage
2.7 – 3.6 V
Power consumption
Approx. 45 mA during operation mode
Approx. 130 µA during tape recording standby
Dimensions (approx.)
50 × 2.8 × 21.5 mm
(2 × 1/8 × 7/8 in.) (w/h/d)
Mass (approx.)
4 g (0.14 oz)

Design and specifications are subject to change without notice.

CAUTION :
Danger of explosion if battery is incorrectly replaced.
Replace only with the same or equivalent type.

SAFETY-RELATED COMPONENT WARNING!!

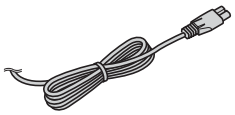
COMPONENTS IDENTIFIED BY MARK ⚠ OR DOTTED LINE WITH MARK ⚠ ON THE SCHEMATIC DIAGRAMS AND IN THE PARTS LIST ARE CRITICAL TO SAFE OPERATION. REPLACE THESE COMPONENTS WITH SONY PARTS WHOSE PART NUMBERS APPEAR AS SHOWN IN THIS MANUAL OR IN SUPPLEMENTS PUBLISHED BY SONY.

ATTENTION AU COMPOSANT AYANT RAPPORT À LA SÉCURITÉ!

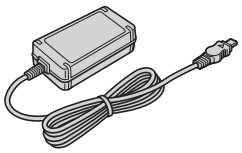
LES COMPOSANTS IDENTIFÉS PAR UNE MARQUE ⚠ SUR LES DIAGRAMMES SCHÉMATIQUES ET LA LISTE DES PIÈCES SONT CRITIQUES POUR LA SÉCURITÉ DE FONCTIONNEMENT. NE REMPLACER CES COMPOSANTS QUE PAR DES PIÈSES SONY DONT LES NUMÉROS SONT DONNÉS DANS CE MANUEL OU DANS LES SUPPÉMENTS PUBLIÉS PAR SONY.

Checking supplied accessories.

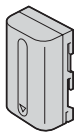
Make sure that the following accessories are supplied with your camcorder.



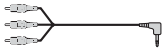
Power cord (Main lead)(1)
(TRV38:E/TRV38E:E)
⚠ 1-769-608-11
Power cord (Main lead)(1)
(TRV38:KR)
⚠ 1-776-985-11
Power cord (Main lead)(1)
(TRV38E:CH)
⚠ 1-782-476-11
Power cord (Main lead)(1)
(TRV38:HK/TRV38E:HK)
⚠ 1-783-374-11
Power cord (Main lead)(1)
(TRV38:US, CND/TRV39)
⚠ 1-790-107-22
Power cord (Main lead)(1)
(TRV38:JE/TRV38E:JE)
⚠ 1-790-732-11



AC power adaptor (1)
(AC-L15A/L15B)
⚠ 1-477-533-31

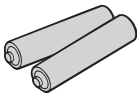


NP-FM30 battery pack (1)
⚠ A-7096-387-A (US, CND)
⚠ A-7096-388-B (EXCEPT US, CND)

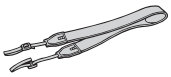


A/V connecting cable (1.5m) (1)
1-824-097-11

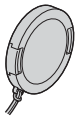
Wireless Remote Commander (1)
(RMT-814E)
1-475-141-61



R6 (size AA) batteries for the Remote Commander (2)
(not supplied)



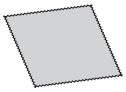
Shoulder strap (1)
3-987-015-01



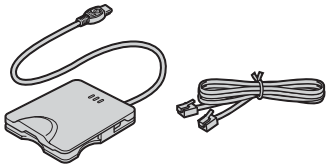
Lens cap (1)
X-3950-537-1

"Memory Stick" (1)
(MSA-8A)
A-7024-735-A

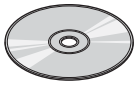
USB cable (1)
1-823-932-11



Cleaning cloth (1)
(not supplied)

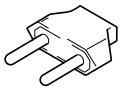


UNA-PSTN MODEM Adaptor (1)
(TRV39 only)
(not supplied)

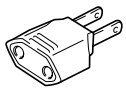


CD-ROM
(SPVD-010 USB Driver) (1)
(TRV38:E,HK,JE,KR/TRV38E)
3-078-942-01
CD-ROM
(SPVD-010 (I) USB Driver) (1)
(TRV38:US,CND/TRV39)
3-078-943-01

Stylus (1)
(TRV39 only)
3-073-941-01



2-pin conversion adaptor (1)
(TRV38:JE/TRV38E:JE only)
1-569-007-12



2-pin conversion adaptor (1)
(TRV38:E, HK/TRV38E:E,HK)
1-569-008-12

• Abbreviation

CND	: Canadian model	JE	: Tourist model
HK	: Hong Kong model	KR	: Korea model
CH	: Chinese model		

Other accessories

3-080-164-11	MANUAL, INSTRUCTION (ENGLISH) (TRV38:US,CND,E,HK,JE/TRV39)
3-080-164-21	MANUAL, INSTRUCTION (FRENCH) (TRV38:CND/TRV39:CND)
3-080-164-31	MANUAL, INSTRUCTION (PORTUGUESE) (TRV38:E,JE)
3-080-164-41	MANUAL, INSTRUCTION (CHINESE) (TRV38:E,HK)
3-080-164-51	MANUAL, INSTRUCTION (KOREAN) (TRV38:JE,KR)
3-080-167-11	MANUAL, INSTRUCTION (ENGLISH/FRENCH) (TRV38E)
3-080-167-21	MANUAL, INSTRUCTION (SWEDISH/RUSSIAN) (TRV38E:E,JE)
3-080-167-31	MANUAL, INSTRUCTION (ARABIC/PERSIAN) (TRV38E:E)
3-080-167-41	MANUAL, INSTRUCTION (CHINESE) (TRV38E:HK)
3-080-167-51	MANUAL, INSTRUCTION (CHINESE) (TRV38E:E,CH,JE)
3-080-307-11	MANUAL, INSTRUCTION (ENGLISH) (TRV39)

Note : The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety. Replace only with part number specified.	**Note :** Les composants identifiés par une marque ⚠ sont critiques pour la sécurité. Ne les remplacer que par une pièce portant le numéro spécifié.

SAFETY CHECK-OUT

After correcting the original service problem, perform the following safety checks before releasing the set to the customer.

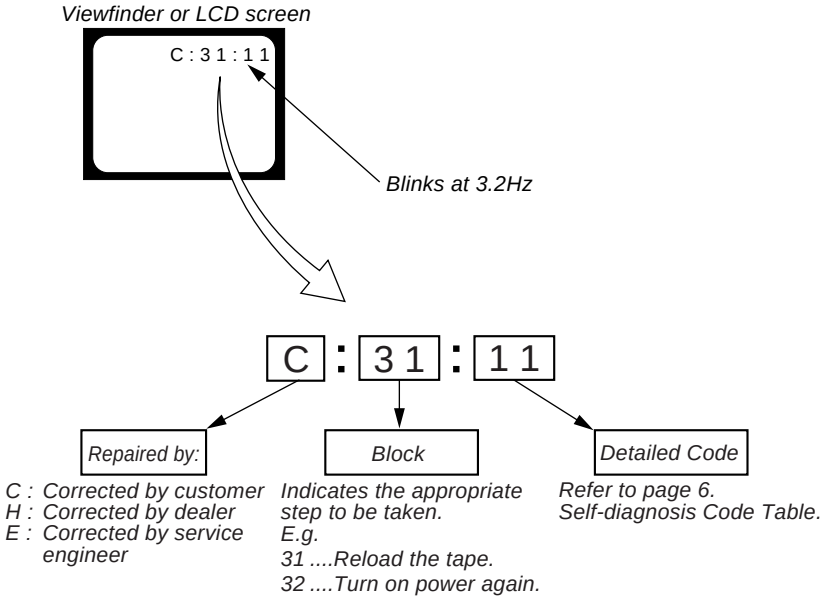
1. Check the area of your repair for unsoldered or poorly-soldered connections. Check the entire board surface for solder splashes and bridges.
2. Check the interboard wiring to ensure that no wires are "pinched" or contact high-wattage resistors.
3. Look for unauthorized replacement parts, particularly transistors, that were installed during a previous repair. Point them out to the customer and recommend their replacement.
4. Look for parts which, through functioning, show obvious signs of deterioration. Point them out to the customer and recommend their replacement.
5. Check the B+ voltage to see it is at the values specified.
6. Flexible Circuit Board Repairing
   - Keep the temperature of the soldering iron around 270˚C during repairing.
   - Do not touch the soldering iron on the same conductor of the circuit board (within 3 times).
   - Be careful not to apply force on the conductor when soldering or unsoldering.

COVER

SELF-DIAGNOSIS FUNCTION

1. SELF-DIAGNOSIS FUNCTION

When problems occur while the unit is operating, the self-diagnosis function starts working, and displays on the viewfinder, or LCD screen what to do. This function consists of two display; self-diagnosis display and service mode display.
Details of the self-diagnosis functions are provided in the Instruction manual.


Viewfinder or LCD screen
C : 3 1 : 1 1
Blinks at 3.2Hz
C : 3 1 : 1 1
Repaired by:
Block
Detailed Code
C : Corrected by customer
H : Corrected by dealer
E : Corrected by service engineer
Indicates the appropriate step to be taken.
E.g.
31 ....Reload the tape.
32 ....Turn on power again.
Refer to page 6.
Self-diagnosis Code Table.

2. SELF-DIAGNOSIS DISPLAY

When problems occur while the unit is operating, the counter of the viewfinder or LCD screen consists of an alphabet and 4-digit number, which blinks at 3.2Hz. This 5-character display indicates the “repaired by:”, “block” in which the problem occurred, and “detailed code” of the problem.

Note: The self-diagnosis display data will be kept even if the lithium battery (BT5201 of CK-131 board) is removed.

3. SELF-DIAGNOSIS CODE TABLE

Self-diagnosis Code					Symptom/State	Correction
Repaired by:	Block Function		Detailed Code			
C	0	4	0	0	Non-standard battery is used.	Use the info LITHIUM battery.
C	2	1	0	0	Condensation.	Remove the cassette, and insert it again after one hour.
C	2	2	0	0	Video head is dirty.	Clean with the optional cleaning cassette.
C	3	1	1	0	LOAD direction. Loading does not complete within specified time	Load the tape again, and perform operations from the beginning.
C	3	1	1	1	UNLOAD direction. Loading does not complete within specified time	Load the tape again, and perform operations from the beginning.
C	3	1	2	0	T reel side tape slacking when unloading.	Load the tape again, and perform operations from the beginning.
C	3	1	2	1	Winding S reel fault when counting the rest of tape.	Load the tape again, and perform operations from the beginning.
C	3	1	2	2	T reel fault.	Load the tape again, and perform operations from the beginning.
C	3	1	2	3	S reel fault.	Load the tape again, and perform operations from the beginning.
C	3	1	2	4	T reel fault.	Load the tape again, and perform operations from the beginning.
C	3	1	3	0	FG fault when starting capstan.	Load the tape again, and perform operations from the beginning.
C	3	1	4	0	FG fault when starting drum.	Load the tape again, and perform operations from the beginning.
C	3	1	4	2	FG fault during normal drum operations.	Load the tape again, and perform operations from the beginning.
C	3	1	1	0	LOAD direction loading motor time-out.	Remove the battery or power cable, connect, and perform operations from the beginning.
C	3	1	1	1	UNLOAD direction loading motor time-out.	Remove the battery or power cable, connect, and perform operations from the beginning.
C	3	2	2	0	T reel side tape slacking when unloading.	Remove the battery or power cable, connect, and perform operations from the beginning.
C	3	2	2	1	Winding S reel fault when counting the rest of tape.	Remove the battery or power cable, connect, and perform operations from the beginning.
C	3	2	2	2	T reel fault.	Remove the battery or power cable, connect, and perform operations from the beginning.
C	3	2	2	3	S reel fault.	Remove the battery or power cable, connect, and perform operations from the beginning.
C	3	2	2	4	T reel fault.	Remove the battery or power cable, connect, and perform operations from the beginning.
C	3	2	3	0	FG fault when starting capstan.	Remove the battery or power cable, connect, and perform operations from the beginning.
C	3	2	4	0	FG fault when starting drum	Remove the battery or power cable, connect, and perform operations from the beginning.
C	3	2	4	2	FG fault during normal drum operations	Remove the battery or power cable, connect, and perform operations from the beginning.

Note: Add the sentence as follows.
If other codes are displayed, service is required.
Please send the set to a specialized center.

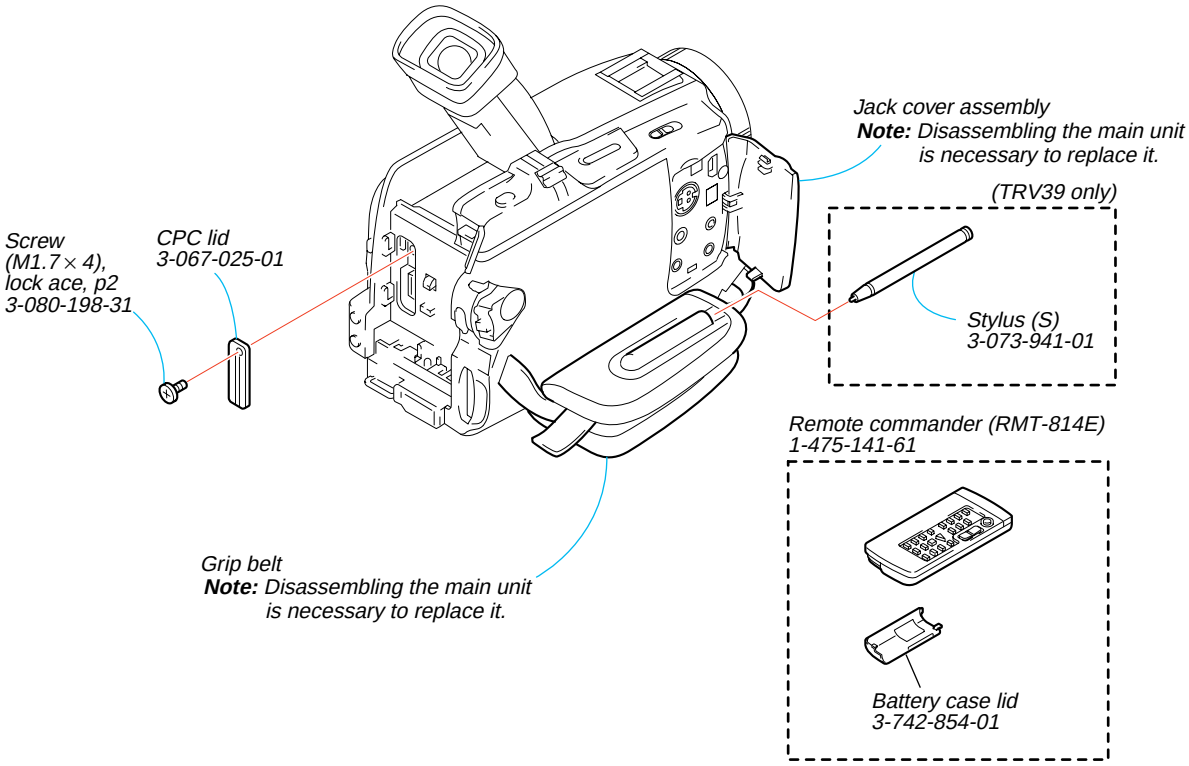
COVER

MAIN PARTS

Note:
- Follow the disassembly procedure in the numerical order given.
- Items marked "*" are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.
- The parts numbers of such as a cabinet are also appeared in this section. Refer to the parts number mentioned below the name of parts to order.

The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety. Replace only with part number specified.

1. ORNAMENTAL PARTS


Jack cover assembly
Note: Disassembling the main unit is necessary to replace it.
(TRV39 only)
Screw (M1.7 × 4), lock ace, p2 3-080-198-31
CPC lid 3-067-025-01
Stylus (S) 3-073-941-01
Remote commander (RMT-814E) 1-475-141-61
Grip belt
Note: Disassembling the main unit is necessary to replace it.
Battery case lid 3-742-854-01

9-876-230-41

Sony EMCS Co.

2003B1600-1
©2003.2
Published by DI Customer Center

SONY

3-080-164-**11**(1)

Digital Video Camera Recorder

Mini DV Digital Video Cassette

Operating Instructions

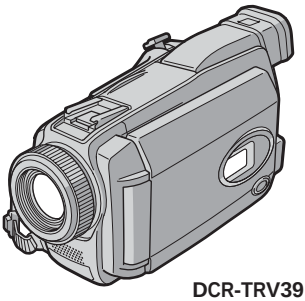
Before operating the unit, please read this manual thoroughly, and retain it for future reference.

Owner's Record

The model and serial numbers are located on the bottom. Record the serial number in the space provided below. Refer to these numbers whenever you call upon your Sony dealer regarding this product.

Model No. **DCR-TRV** _____ Model No. **AC-** _____

Serial No. _____ Serial No. _____



DCR-TRV39

Digital Handycam

Network Handycam

InfoLITHIUM M SERIES

Cassette Memory

MEMORY STICK ™

DCR-TRV38/TRV39

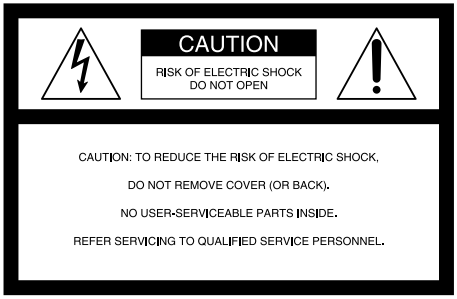
©2003 Sony Corporation

Welcome!

Congratulations on your purchase of this Sony Handycam. With your Handycam, you can capture life's precious moments with superior picture and sound quality. Your Handycam is loaded with advanced features, but at the same time it is very easy to use. You will soon be producing home video that you can enjoy for years to come.

WARNING

To prevent fire or shock hazard, do not expose the unit to rain or moisture.


CAUTION
RISK OF ELECTRIC SHOCK
DO NOT OPEN
CAUTION: TO REDUCE THE RISK OF ELECTRIC SHOCK,
DO NOT REMOVE COVER (OR BACK).
NO USER-SERVICEABLE PARTS INSIDE.
REFER SERVICING TO QUALIFIED SERVICE PERSONNEL.

This symbol is intended to alert the user to the presence of uninsulated "dangerous voltage" within the product's enclosure that may be of sufficient magnitude to constitute a risk of electric shock to persons.

This symbol is intended to alert the user to the presence of important operating and maintenance (servicing) instructions in the literature accompanying the appliance.

Notice

If static electricity or electromagnetism causes data transfer to discontinue midway (fail), restart the application or disconnect and connect the USB cable again.

For customers in the U.S.A. and CANADA

CAUTION

TO PREVENT ELECTRIC SHOCK, MATCH WIDE BLADE OF PLUG TO WIDE SLOT, FULLY INSERT.

RECYCLING LITHIUM-ION BATTERIES

Lithium-Ion batteries are recyclable.
You can help preserve our environment by returning your used rechargeable batteries to the collection and recycling location nearest you.

For more information regarding recycling of rechargeable batteries, call toll free 1-800-822-8837, or visit http://www.rbrc.org/

Caution: Do not handle damaged or leaking Lithium-Ion batteries.

"Memory Stick"

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

This Class B digital apparatus complies with Canadian ICES-003.

For customers in the U.S.A.

If you have any questions about this product, you may call:
Sony Customer Information Center 1-800-222-SONY (7669)
The number below is for the FCC related matters only.

Regulatory Information

Declaration of Conformity

Trade Name:	SONY
Model No.:	DCR-TRV38, DCR-TRV39
Responsible Party:	Sony Electronics Inc.
Address:	680 Kinderkamack Road, Oradell, NJ07649 U.S.A.
Telephone No.:	201-930-6972

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2)this device must accept any interference received, including interference that may cause undesired operation.

CAUTION

You are cautioned that any changes or modifications not expressly approved in this manual could void your authority to operate this equipment.

Note:

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

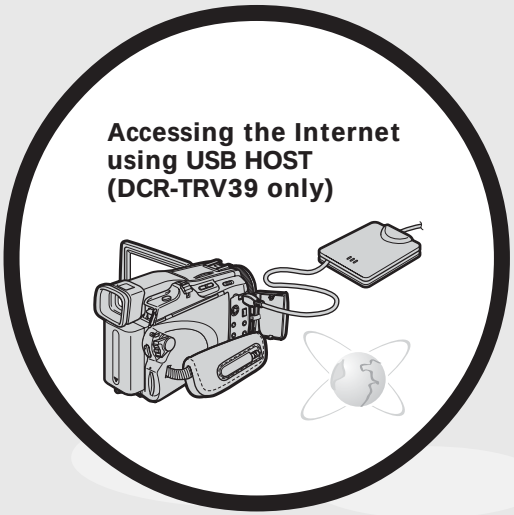
— Reorient or relocate the receiving antenna.
— Increase the separation between the equipment and receiver.
— Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
— Consult the dealer or an experienced radio/TV technician for help.

The supplied interface cable must be used with the equipment in order to comply with the limits for a digital device pursuant to Subpart B of Part 15 of FCC Rules.

Main Features

- Recording moving pictures on the tape (p. 26)
- Playing back the tape (p. 38)
- Recording still images on the "Memory Stick" (p. 45, 106)
- Recording moving pictures on the "Memory Stick" (p. 116)
- Viewing still images recorded on the "Memory Stick" (p. 124)
- Viewing moving pictures recorded on the "Memory Stick" (p. 126)

- Viewing moving pictures recorded on the tape using the USB cable (p. 150)
- Viewing images recorded on the "Memory Stick" using the USB cable (p. 157, 162)
- Capturing images on the computer from your camcorder using the USB cable (p. 152)
- Converting an analog signal into digital to capture images onto the computer (p. 163)



You can access the Internet using a dedicated accessory that serves as a USB Network Adaptor.
For details, refer to the Network Function/Application Operating Instructions supplied with your camcorder. (DCR-TRV39 only) (p. 165)

Other uses

Functions for adjusting exposure during recording

- Back light function (p. 33)
- NightShot/Super NightShot/Color Slow Shutter (p. 33)
- PROGRAM AE (p. 58)
- Manual exposure (p. 60)
- Flexible Spot Meter (p. 61)

Functions for giving images more impact

- Digital zoom (p. 32)
  The default setting is **OFF**. (To zoom greater than 10×, select the digital zoom power in **D ZOOM** in the menu settings.)
- Fader (p. 51)
- Picture effect (p. 54)
- Digital effect (p. 55)
- Title (p. 94)
- MEMORY MIX (p. 112)

Functions for giving a natural appearance to your recordings

- PROGRAM AE (p. 58)
  – SPORTS
  – LANDSCAPE
- Manual focus (p. 62)
- Spot Focus (p. 63)

Functions for using after recording

- End search/Edit search/Rec Review (p. 36)
- Data code (p. 39)
- Tape PB ZOOM/Memory PB ZOOM (p. 70, 129)
- Zero set memory (p. 71)
- Title search (p. 72)
- Digital program editing (p. 77, 121)

Table of contents

Main Features 4

Quick Start Guide

– Recording on tape 8
– Recording on "Memory Stick" 10

Getting Started

Using this manual 12
Checking supplied accessories 14
Step 1 Preparing the power source 15
Installing the battery pack 15
Charging the battery pack 16
Connecting to a wall outlet 20
Step 2 Setting the date and time 21
Step 3 Using the touch panel 24

Recording – Basics

Recording a picture 26
Shooting backlit subjects
– Back light function 33
Shooting in the dark
– NightShot/Super NightShot/
Color Slow Shutter 33
Checking recordings
– End search/Edit search/Rec
Review 36

Playback – Basics

Playing back tape 38
To display the screen indicators
– Display function 39
Viewing a recording on TV 43

Advanced Recording Operations

Recording still images on "Memory Stick" during tape recording standby or tape recording 45
Self-timer recording 47
Adjusting the white balance manually 48
Using the wide mode 49
Using the fader function 51
Using special effects
– Picture effect 54
Using special effects – Digital effect ... 55
Using PROGRAM AE 58
Adjusting the exposure manually 60
Using spot light-metering function
– Flexible Spot Meter 61
Focusing manually 62
Using spot focus function
– Spot Focus 63
Interval Recording 64
Frame by frame recording
– Frame recording 65
Using the viewfinder 66

Advanced Playback Operations

Playing back tape with picture effect 68
Playing back tape with digital effect 69
Enlarging images recorded on tape
– Tape PB ZOOM 70
Quickly locating a scene
– Zero set memory 71
Searching the boundaries of recorded tape by title – Title search 72
Searching a recording by date
– Date search 73

Editing

Dubbing tape 75
Dubbing only desired scenes
– Digital program editing
(on tape) 77
Recording video or TV programs 86
Inserting a scene from a VCR
– Insert editing 88
Audio dubbing 90
Superimposing a title on a cassette with Cassette Memory 94
Making your own titles 96
Labeling a cassette on a cassette with Cassette Memory 97
Erasing all the data in
Cassette Memory 98

"Memory Stick" Operations

Using "Memory Stick"
– Introduction 99
Selecting the quality and size of image data 102
Recording still images on "Memory Stick"
– Memory Photo recording 106
Recording an image from tape as a still image 110

Superimposing a still image in "Memory Stick" on an image – MEMORY MIX 112
Interval Photo Recording 115
Recording moving pictures on "Memory Stick" – MPEG MOVIE recording 116
Self-timer recording 118
Recording a picture from tape as a moving picture 119
Recording edited pictures from tape as a moving picture – Digital program editing (on "Memory Stick") 121
Changing the recording folder 123
Viewing a still image – Memory Photo playback 124
Viewing a moving picture – MPEG MOVIE playback 126
Choosing playback folder 128
Enlarging still images recorded on "Memory Stick" – Memory PB ZOOM 129
Playing back images continuously – Slide show 130
Preventing accidental erasure – Image protection 131
Deleting images – DELETE 132
Changing image size – Resize 135
Writing a print mark – Print mark ... 136

Viewing images with a computer

Viewing images with a computer – Introduction 137
Connecting your camcorder to a computer using the USB cable (For Windows users) 140
Viewing pictures recorded on tape on a computer – USB Streaming (For Windows users) 150
Viewing images recorded on "Memory Stick" on a computer (For Windows users) 157
Connecting your camcorder to a computer using the USB cable (For Macintosh users) 160
Viewing images recorded on "Memory Stick" on a computer (For Macintosh users) 162
Capturing images from an analog video unit on a computer – Signal convert function 163

Using the Network function (DCR-TRV39 only)

Accessing the network 165
For details, refer to the Network Function/Application Operating Instructions supplied with your camcorder.

Customizing Your Camcorder

Changing the menu settings 167

Troubleshooting

Types of trouble and how to correct trouble 178
Self-diagnosis display 186
Warning indicators 187
Warning messages 188

Additional Information

Usable cassettes 189
About the "InfoLITHIUM" battery pack 192
About i.LINK 194
Using your camcorder abroad 196
Maintenance information and precautions 197
Specifications 203

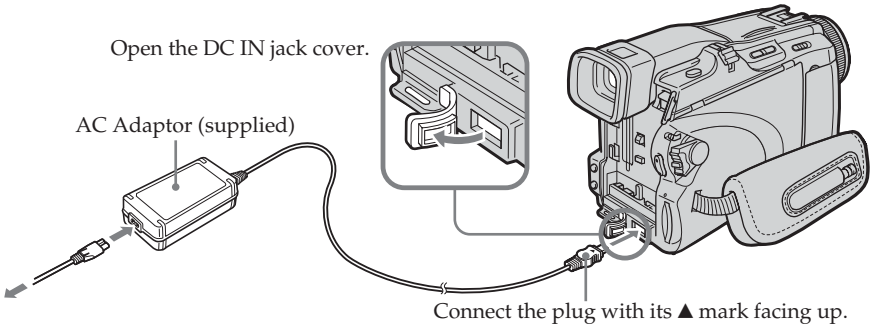
Quick Reference

Identifying parts and controls 205
Index ..... Back cover

Quick Start Guide – Recording on tape

1 Connecting the power cord

Use the battery pack when using your camcorder outdoors (p. 15).

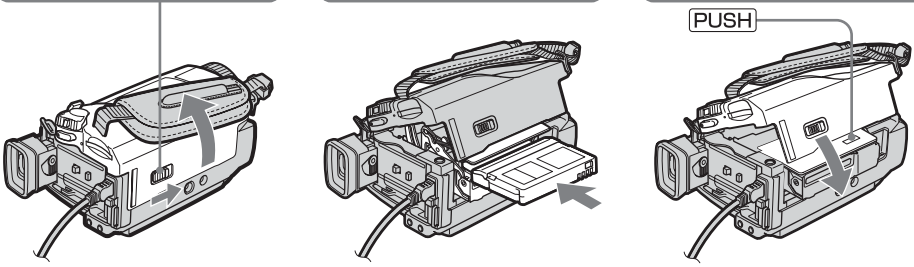


2 Inserting the cassette

1 Slide ◣ OPEN/EJECT in the direction of the arrow and open the lid.

2 Push the center of the cassette back to insert the cassette. Insert the cassette straight as far as possible into the cassette compartment with the window facing up.

3 Close the cassette compartment by pressing PUSH on the cassette compartment. After the cassette compartment goes down completely, close the lid until it clicks.



To eject the cassette

Follow the procedures above, and take out the cassette after the cassette compartment opens completely in step 3.

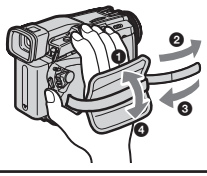
Note

Do not press the cassette compartment down forcibly. Doing so may cause a malfunction.

How to hold your camcorder

Fastening the grip belt

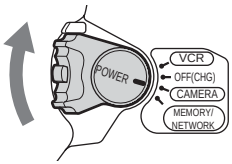
Fasten the grip belt firmly.



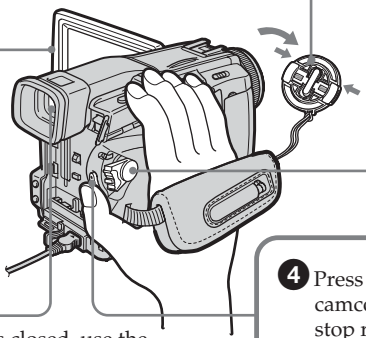
3 Recording a picture on the tape (p. 26)

1 Remove the lens cap.

2 Set the POWER switch to CAMERA while pressing the small green button.



3 Press OPEN to open the LCD panel. The picture appears on the screen.



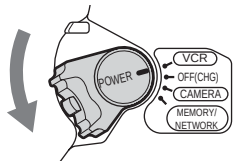
4 Press START/STOP. Your camcorder starts recording. To stop recording, press START/STOP again.

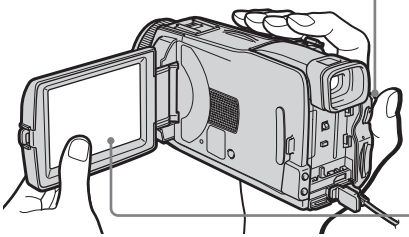
Viewfinder
When the LCD panel is closed, use the viewfinder with your eye against the eyecup. Adjust the viewfinder lens to your eyesight (p. 31).

When you purchase your camcorder, the clock setting is set to off. If you want to record the date and time for a picture, set the clock setting before recording (p. 21).

4 Monitoring the playback picture on the LCD screen (p. 38)

1 Set the POWER switch to VCR while pressing the small green button.





2 Press ◄◄ of the touch panel to rewind the tape.

3 Press ►II of the touch panel to start playback.

Note
When using the touch panel, press operation buttons lightly with your finger or the supplied stylus (DCR-TRV39 only) supporting the LCD panel from the back side of it. Do not press the LCD screen with sharp objects other than the supplied stylus (DCR-TRV39 only).

Do not pick up your camcorder by holding parts as illustrated.

Viewfinder

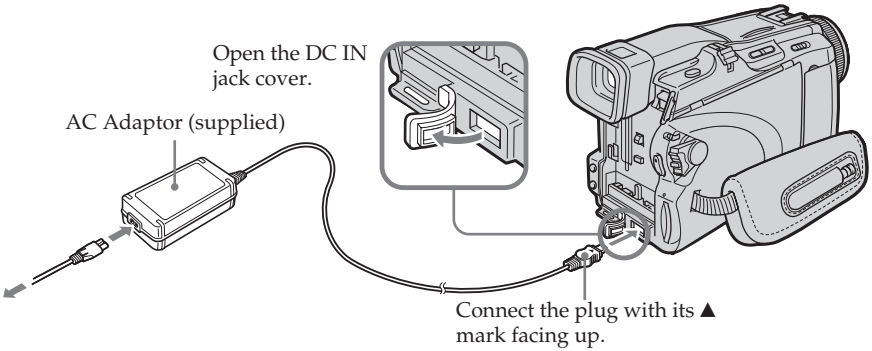
LCD panel

Battery pack

Quick Start Guide – Recording on "Memory Stick"

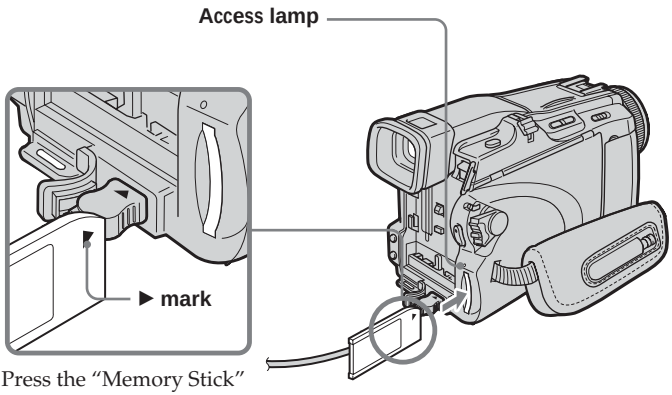
1 Connecting the power cord

Use the battery pack when using your camcorder outdoors (p. 15).



2 Inserting the "Memory Stick" (p. 101)

Insert the "Memory Stick" in the "Memory Stick" slot as far as it can go with the ▶ mark facing up as illustrated.

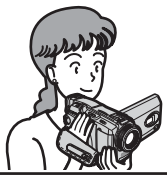


Press the "Memory Stick" once lightly to eject it.

While the access lamp is lit or flashing

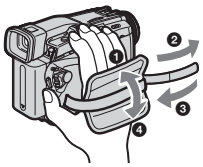
Do not shake or strike your camcorder because your camcorder is reading the data from the "Memory Stick" or recording the data on the "Memory Stick." Do not turn the power off, eject the "Memory Stick" or remove the battery pack. Otherwise, image data breakdown may occur.

How to hold your camcorder



Fastening the grip belt

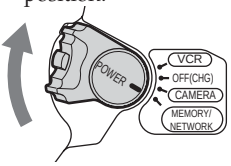
Fasten the grip belt firmly.



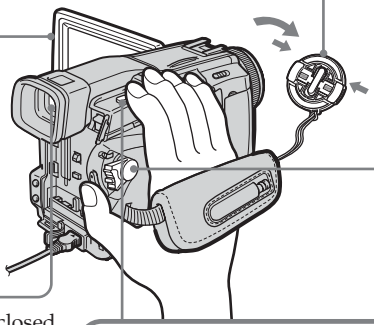
3 Recording still images on the "Memory Stick" (p. 106)

1 Remove the lens cap (p. 26).

2 Set the POWER switch to MEMORY while pressing the small green button.
Make sure that the LOCK switch is set to the left (unlock) position.



3 Press OPEN to open the LCD panel. The picture appears on the screen.



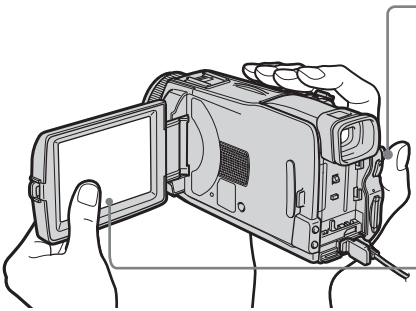
Viewfinder
When the LCD panel is closed, use the viewfinder with your eye against the eyecup. Adjust the viewfinder lens to your eyesight (p. 31).

4 Press PHOTO lightly. When the green ● mark stops flashing, then lights up, you can record a still image.

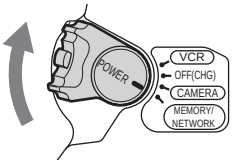
5 Press PHOTO deeply. The image when you pressed PHOTO deeply will be recorded on the "Memory Stick."

When you purchase your camcorder, the clock setting is set to off. If you want to record the date and time for a picture, set the clock setting before recording (p. 21).

4 Monitoring the playback still image on the LCD screen (p. 124)



1 Set the POWER switch to MEMORY while pressing the small green button.



2 Press PLAY. The last recorded image is displayed.

PLAY

Do not pick up your camcorder by holding parts as illustrated.

Viewfinder

LCD panel

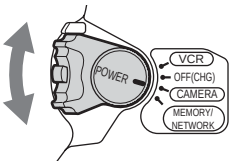
Battery pack

Using this manual

The instructions in this manual are for the two models listed in the table below. Before you start reading this manual and operating your camcorder, check the model number by looking at the bottom of your camcorder. The DCR-TRV39 is the model used for illustration purposes. Otherwise, the model name is indicated in the illustrations. Any differences in operation are clearly indicated in the text, for example, "DCR-TRV39 only."

As you read through this manual, buttons and settings on your camcorder are shown in capital letters.

After "Advanced Recording Operations" section of this manual, position of the POWER switch is shown by the icons below.



(VCR) : Set the POWER switch to VCR.

(CAMERA) : Set the POWER switch to CAMERA.

(MEMORY) : Set the POWER switch to MEMORY/NETWORK (DCR-TRV39 only).

DCR-TRV39 only

The MEMORY/NETWORK position of the POWER switch is shown as MEMORY or (MEMORY) in this manual.

When you carry out an operation, you can hear a beep to indicate that the operation is being carried out.

Types of differences

DCR-	TRV38	TRV39
Mark on the POWER switch	MEMORY	MEMORY/NETWORK
Network function	—	●

● Provided
— Not provided

Note on Cassette Memory

Your camcorder is based on the DV format. You can use only mini DV cassettes with your camcorder. We recommend that you use a cassette with Cassette Memory .

Cassettes with Cassette Memory have the (Cassette Memory) mark.

Note on TV color systems

TV color systems differ depending on the country or area. To view your recordings on a TV, you need an NTSC system-based TV.

Copyright precautions

Television programs, films, video tapes, and other materials may be copyrighted. Unauthorized recording of such materials may be contrary to the copyright laws.

Note on connecting to other devices

If you connect your camcorder to a VCR or computer using the USB cable or the i.LINK cable, make sure that the jack is connected in the right direction. Pushing it forcibly may damage the jack or cause your camcorder to malfunction.

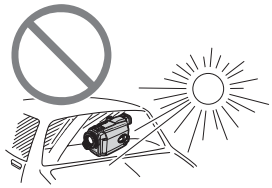
Precautions on camcorder care

Lens and LCD screen/finder (on mounted models only)

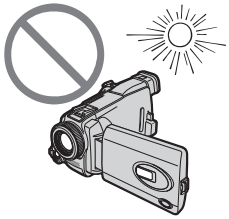
- **The LCD screen and the finder are manufactured using extremely high-precision technology, so over 99.99% of the pixels are operational for effective use. However, there may be some tiny black points and/or bright points (white, red, blue or green in color) that constantly appear on the LCD screen and the finder. These points are normal in the manufacturing process and do not affect the recording in any way.**
- Do not let your camcorder get wet. Keep your camcorder away from rain and sea water. Letting your camcorder get wet may cause your camcorder to malfunction. Sometimes this malfunction cannot be repaired **[a]**.
- Never leave your camcorder exposed to temperatures above 60°C (140°F), such as in a car parked in the sun or under direct sunlight **[b]**.
- Be careful when placing the camera near a window or outdoors. Exposing the LCD screen, the finder or the lens to direct sunlight for long periods may cause malfunctions **[c]**.
- Do not directly shoot the sun. Doing so might cause your camcorder to malfunction. Take pictures of the sun in low light conditions such as dusk **[d]**.

[a]

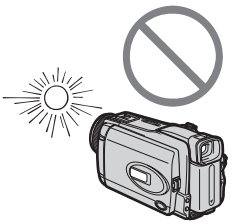
[b]



[c]

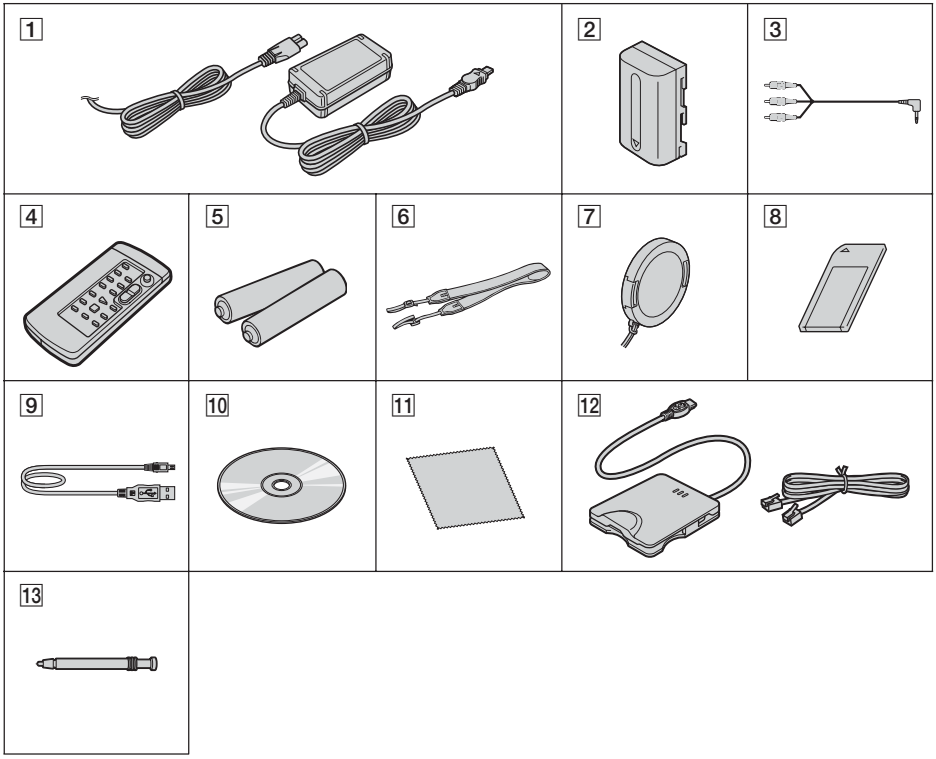


[d]



Checking supplied accessories

Make sure that the following accessories are supplied with your camcorder.



1 **AC-L15A/L15B AC Adaptor** (1), **Power cord** (1) (p. 16)

2 **NP-FM30 rechargeable battery pack** (1) (p. 15, 16)

3 **A/V connecting cable** (1) (p. 43)

4 **Wireless Remote Commander** (1) (p. 210)

5 **Size AA (R6) battery for Remote Commander** (2) (p. 210)

6 **Shoulder strap** (1)

7 **Lens cap** (1) (p. 26)

8 **"Memory Stick"** (1) (p. 99)

9 **USB cable** (1) (p. 137)

10 **CD-ROM (SPVD-010 USB Driver)** (1) (p. 142)

11 **Cleaning cloth** (1) (p. 198)

12 **UNA-PSTN Modem Adaptor** (1), **Telephone cord** (1) (DCR-TRV39 only) (p. 165)

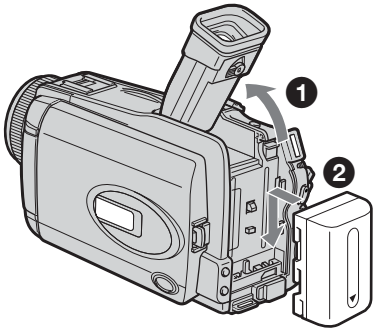
13 **Stylus** (1) (DCR-TRV39 only) (p. 166)

Contents of the recording cannot be compensated if recording or playback is not made due to a malfunction of the camcorder, storage media, etc.

Step 1 Preparing the power source

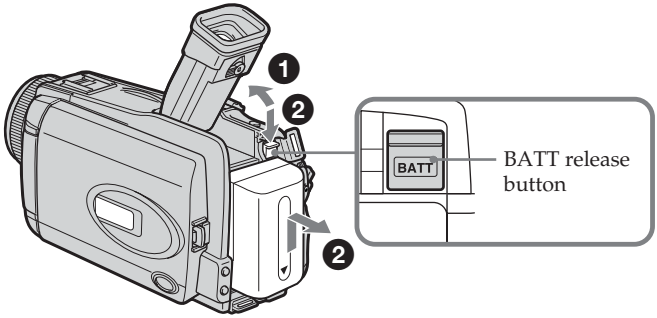
Installing the battery pack

(1) Lift up the viewfinder.
(2) Slide the battery pack down until it clicks.



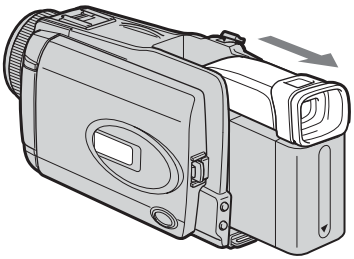
To remove the battery pack

(1) Lift up the viewfinder.
(2) Slide the battery pack out in the direction of the arrow while pressing BATT down.



If you use the large capacity battery pack

If you install the NP-FM70/QM71/QM71D/FM91/QM91/QM91D battery pack on your camcorder, extend its viewfinder.

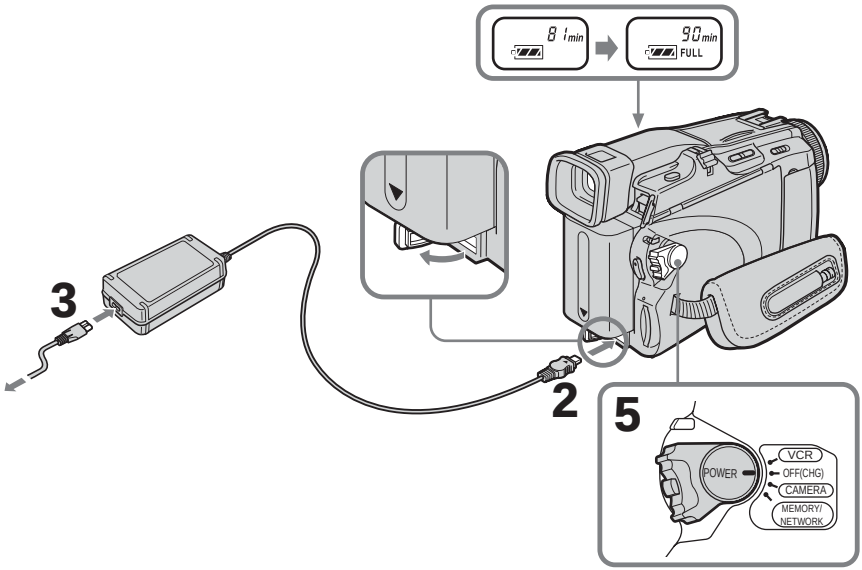


Charging the battery pack

Use the battery pack after charging it for your camcorder.
Your camcorder operates only with the **"InfoLITHIUM" battery pack (M series)**.
See page 192 for details of "InfoLITHIUM" battery pack.

(1) Install the battery pack on your camcorder.
(2) Connect the AC Adaptor supplied with your camcorder to the DC IN jack with the DC plug's ▲ mark facing up.
(3) Connect the power cord to the AC Adaptor.
(4) Connect the power cord to a wall outlet.
(5) Set the POWER switch to OFF (CHG).
Charging begins. The remaining battery time is indicated in minutes in the display window.

When the remaining battery time indicator changes to , **normal charge** is complete. To fully charge the battery pack **(full charge)**, leave the battery pack attached for about one hour after normal charge is complete until the FULL indicator appears in the display window. Fully charging the battery pack allows you to use the battery pack longer than usual.



After charging the battery pack

Disconnect the AC Adaptor from the DC IN jack on your camcorder.

Note

Prevent metallic objects from coming into contact with the metal parts of the DC plug of the AC Adaptor. This may cause a short-circuit, damaging the AC Adaptor.

When you use the AC Adaptor

Place the AC Adaptor near a wall outlet. While using the AC Adaptor if any trouble occurs with this unit, disconnect the plug from a wall outlet as soon as possible to cut off the power.

Remaining battery time indicator

The remaining battery time indicator in the display window indicates the approximate recording time when recording with the viewfinder.

Until your camcorder calculates the actual remaining battery time

"---- min" appears in the display window.

Charging time

Battery pack	Full charge (Normal charge)
NP-FM30 (supplied)	145 (85)
NP-FM50	150 (90)
NP-FM70	240 (180)
NP-QM71/QM71D	260 (200)
NP-FM91/QM91/QM91D	360 (300)

Approximate minutes at 25°C (77°F) to charge an empty battery pack
The charging time may increase if the battery's temperature is extremely high or low because of the ambient temperature.

Recording time

DCR-TRV38

Battery pack	Recording with the viewfinder		Recording with the LCD screen	
	Continuous	Typical*	Continuous	Typical*
NP-FM30 (supplied)	95	55	70	40
NP-FM50	155	90	110	60
NP-FM70	320	185	240	140
NP-QM71/QM71D	375	220	275	160
NP-FM91/QM91/QM91D	565	330	420	245

Approximate minutes when you use a fully charged battery pack

* Approximate number of minutes when recording while you repeat recording start/stop, zooming and turning the power on/off. The actual battery life may be shorter.

DCR-TRV39

Battery pack	Recording with the viewfinder		Recording with the LCD screen	
	Continuous	Typical*	Continuous	Typical*
NP-FM30 (supplied)	90	50	65	35
NP-FM50	150	85	110	60
NP-FM70	310	180	230	135
NP-QM71/QM71D	365	215	270	155
NP-FM91/QM91/QM91D	550	320	410	240

Approximate minutes when you use a fully charged battery pack

* Approximate number of minutes when recording while you repeat recording start/stop, zooming and turning the power on/off. The actual battery life may be shorter.

Playing time

Battery pack	Playing time with the LCD panel closed	Playing time on the LCD screen
NP-FM30 (supplied)	130	90
NP-FM50	210	145
NP-FM70	430	305
NP-QM71/QM71D	505	355
NP-FM91/QM91/QM91D	755	535

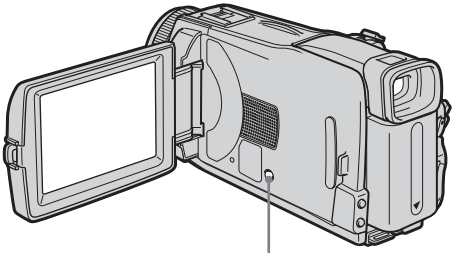
Approximate minutes when you use a fully charged battery pack

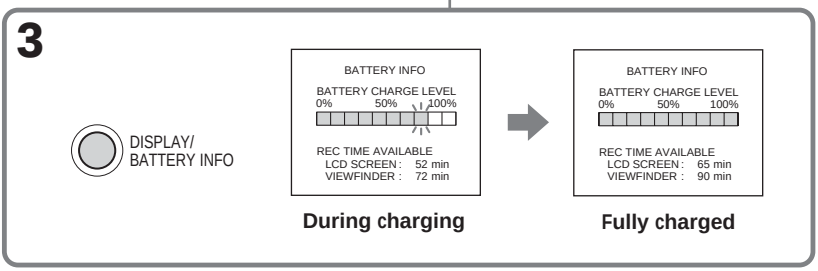
Note

Approximate recording time and continuous playing time at 25°C (77°F). The battery life will be shorter if you use your camcorder in a cold environment.

Checking status of battery pack – Battery Info

(1) Set the POWER switch to OFF (CHG).
(2) Press OPEN to open the LCD panel.
(3) Press DISPLAY/BATTERY INFO.
The battery charge level (the percentage of remaining battery time) and remaining battery time when using the LCD screen or viewfinder are displayed for about seven seconds.
If you keep pressing DISPLAY/BATTERY INFO, the Battery Info is displayed for up to about 20 seconds.





Note

The BATTERY INFO indicator is not displayed in the following cases:
– The battery pack is not properly installed.
– Something is wrong with the battery pack.
– The battery pack is fully discharged.

Battery Info

The number displayed as Battery Info is the approximate recording time.

While the remaining battery time is being calculated

"CALCULATING BATTERY INFO..." is displayed.

Connecting to a wall outlet

Connect in the same way as when charging the battery pack (p. 16).

PRECAUTION

The set is not disconnected from the AC power source (house current) as long as it is connected to the wall outlet, even if the set itself has been turned off.

Notes

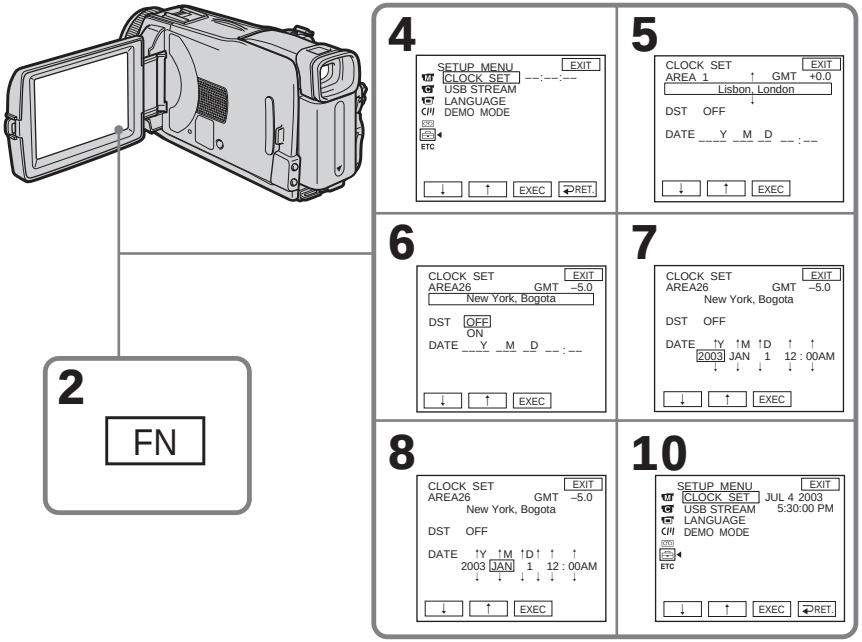
- The AC Adaptor can supply power from a wall outlet even if the battery pack is attached to your camcorder.
- The DC IN jack has "source priority." This means that the battery pack cannot supply any power if the power cord is connected to the DC IN jack, even when the power cord is not plugged into a wall outlet.

Step 2 Setting the date and time

Set the date and time when you use your camcorder for the first time. The “CLOCK SET” indicator will appear each time you set the POWER switch to CAMERA or MEMORY unless you set the date and time settings.
If you do not set the date and time, “--- -- ----” and “--:--:--” are recorded on the tape or the “Memory Stick” as the data code.
If you do not use your camcorder for **about three months**, the date and time settings may be released (bars may appear) because the built-in rechargeable battery installed in your camcorder will have been discharged (p. 199). In this case, charge the built-in rechargeable battery, then set your area, the daylight saving time (DST*), the year, the month, the day, the hour and the minute.

* Instead of DST, SUMMERTIME is displayed on the screen for some models.

(1) Set the POWER switch to CAMERA or MEMORY.
(2) Press FN (Function) to display PAGE1 (p. 24).
(3) Press MENU to display the menu.
(4) Press ↓/↑ to select [toolbox], then press EXEC.
(5) Press ↓/↑ to select CLOCK SET, then press EXEC.
(6) Press ↓/↑ to select your area, then press EXEC.
(7) Press ↓/↑ to select whether your area is in the daylight saving time or not, then press EXEC.
(8) Press ↓/↑ to select a desired year, then press EXEC.
(9) Set the month, day and hour with the same procedure as step 8.
(10) Press ↓/↑ to set the minute, then press EXEC by the time signal. The clock starts to move.



To return to FN (Function)

Press EXIT.

When using your camcorder abroad

Set the clock to the local time (p. 23).

If you use your camcorder in an area where daylight saving time is used

Set DST SET in ETC to ON in the menu settings.

Note on the time indicator

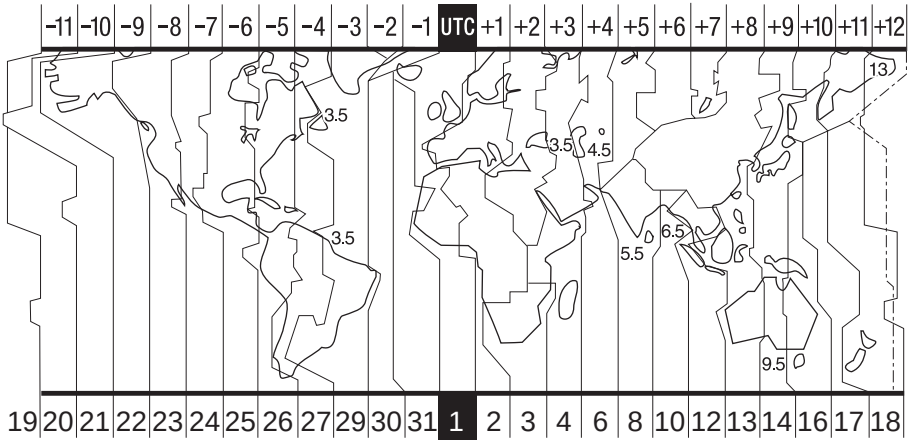
The internal clock of your camcorder operates on a 12-hour cycle.

- 12:00 AM stands for midnight.
- 12:00 PM stands for noon.

Simple setting of clock by time difference

You can easily set the clock to the local time by setting a time difference. Select AREA SET and DST SET* in ETC in the menu settings.
See page 176 for details.
* Instead of DST, SUMMERTIME is displayed on the screen for some models.

World time difference



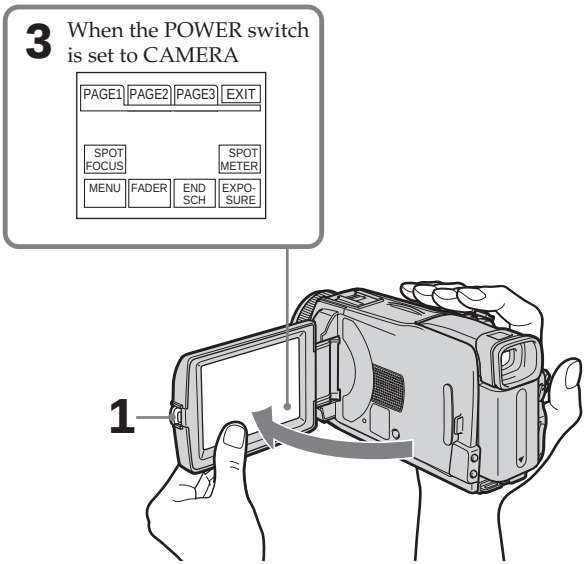
Area code	Time-zone differences	Area setting
1	GMT	Lisbon, London
2	+01:00	Berlin, Paris
3	+02:00	Helsinki, Cairo
4	+03:00	Moscow, Nairobi
5	+03:30	Tehran
6	+04:00	Abu Dhabi, Baku
7	+04:30	Kabul
8	+05:00	Karachi, Islamabad
9	+05:30	Calcutta, New Delhi
10	+06:00	Almaty, Dhaka
11	+06:30	Rangoon
12	+07:00	Bangkok, Jakarta
13	+08:00	HongKong, Singapore
14	+09:00	Seoul, Tokyo
15	+09:30	Adelaide, Darwin
16	+10:00	Melbourne, Sydney

Area code	Time-zone differences	Area setting
17	+11:00	Solomon Is
18	+12:00	Fiji, Wellington
19	–12:00	Eniwetok, Kwajalein
20	–11:00	Midway Is., Samoa
21	–10:00	Hawaii
22	–09:00	Alaska
23	–08:00	LosAngeles, Tijuana
24	–07:00	Denver, Arizona
25	–06:00	Chicago, MexicoCity
26	–05:00	New York, Bogota
27	–04:00	Santiago
28	–03:30	St. John's
29	–03:00	Brasilia, Montevideo
30	–02:00	Fernando de Noronha
31	–01:00	Azores

Step 3 Using the touch panel

Your camcorder has operation buttons on the LCD screen.
Touch the LCD screen directly with your finger or the supplied stylus (DCR-TRV39 only) to operate each function.

(1) Press OPEN to open the LCD panel.
(2) Set the POWER switch to CAMERA to record, VCR to play back or MEMORY to use the "Memory Stick."
(3) Press FN. Operation buttons on PAGE1 are displayed on the LCD screen.
(4) Press PAGE2/PAGE3 to display PAGE2/PAGE3. Operation buttons on PAGE2/PAGE3 are displayed on the LCD screen.
(5) Press a desired operation item. See relevant pages of this manual for each function.



To return to FN
Press EXIT.

To execute settings
Press ↩ OK. The display returns to PAGE1/PAGE2/PAGE3.

To cancel settings
Press ↩ OFF. The display returns to PAGE1/PAGE2/PAGE3.

To make screen indicators disappear
Press DISPLAY/BATTERY INFO.

Operation buttons on each display

When the POWER switch is set to CAMERA

PAGE1	SPOT FOCUS, MENU, FADER, END SCH, SPOT METER, EXPOSURE
PAGE2	SELFTIMER, DIG EFFT, LCD BRT, VOL, MEM MIX
PAGE3	SUPER NS, COLOR SLW S

When the POWER switch is set to VCR

PAGE1	MENU, LCD BRT, VOL, END SCH
PAGE2	PB ZOOM, DIG EFFT, DATA CODE
PAGE3	V SPD PLAY, A DUB CTRL, REC CTRL

When the POWER switch is set to MEMORY

During memory camera

PAGE1	SPOT FOCUS, MENU, PLAY, PB FOLDR, SPOT METER, EXPOSURE
PAGE2	SELFTIMER, PLAY, MEM MIX
PAGE3	LCD BRT, PLAY, VOL

During memory playback

PAGE1	MENU, CAM, PB FOLDR, DEL
PAGE2	PB ZOOM, CAM, RESIZE, DATA CODE
PAGE3	LCD BRT, CAM, VOL

Notes

- When using the touch panel, press operation buttons lightly with your finger or the supplied stylus (DCR-TRV39 only) supporting the LCD panel from the back side of it.
- Do not press the LCD screen with sharp objects other than the supplied stylus. (DCR-TRV39 only)
- Do not press the LCD screen too hard.
- Do not touch the LCD screen with wet hands.
- If FN is not on the LCD screen, touch the LCD screen lightly to make it appear. You can control the display with DISPLAY/BATTERY INFO on your camcorder.

When executing each item

The green bar appears above the item.

If the items are not available

The color of the items changes to gray.

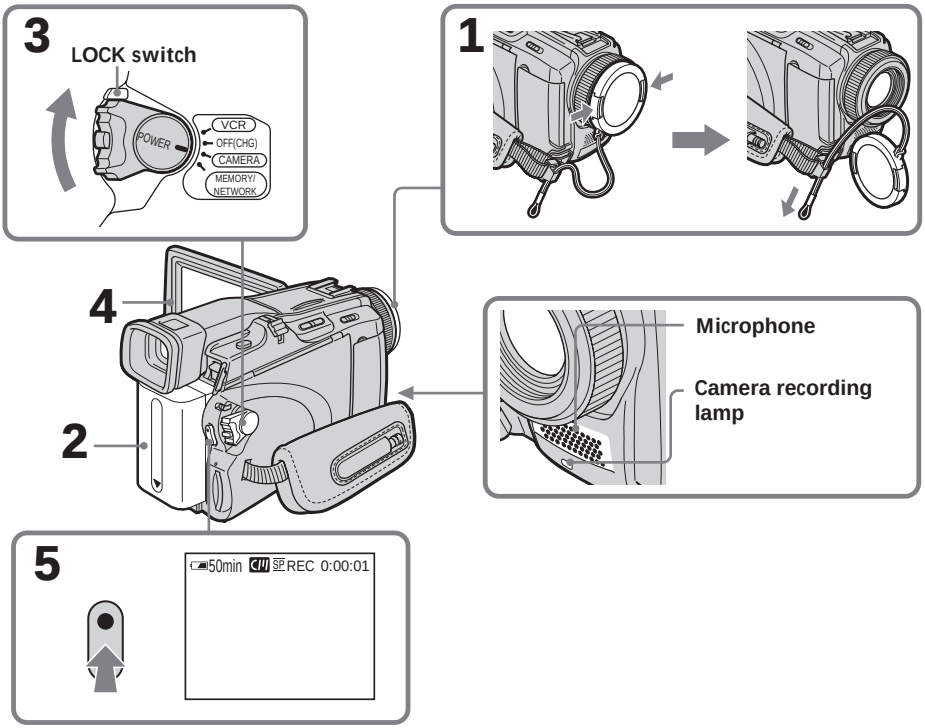
Touch panel

You can operate with the touch panel using the viewfinder (p. 66).

Recording a picture

See relevant “Step 1” and “Step 2.”

(1) Remove the lens cap and pull the lens cap string to fix it.
(2) Prepare the power source (p. 15 to 20) and insert the cassette (p. 8).
(3) Set the POWER switch to CAMERA while pressing the small green button. This sets your camcorder to standby.
(4) Press OPEN to open the LCD panel. The picture appears on the screen.
(5) Press START/STOP. Your camcorder starts recording. The REC indicator appears. The camera recording lamp located on the front of your camcorder lights up. To stop recording, press START/STOP again.



Note on recording

Your camcorder records and plays back in the SP (standard play) mode and in the LP (long play) mode. Select SP or LP in the menu settings (p. 174). In the LP mode, you can record **1.5 times** as long as in the SP mode.
When you record the tape in the LP mode on your camcorder, we recommend playing back the tape on your camcorder.

To enable smooth transition

Transition between the last scene you recorded and the next scene is smooth as long as you do not eject the cassette even if you turn off your camcorder.
However, check the following:
– Do not mix recordings in the SP and LP modes on one tape.
– When you change the battery pack, set the POWER switch to OFF (CHG).

Self-timer recording

You can record images on the tape with the self-timer. See page 47 for details.

Note

The recording data (date/time or various settings when recorded) do not appear during recording. However, they are recorded automatically on the tape. To display the recording data, press DATA CODE during playback. You can also use the Remote Commander for this operation (p. 39).

If you leave your camcorder during standby for five minutes while the cassette is inserted

Your camcorder automatically turns off. This is to save battery power and to prevent battery pack and tape wear. To return to standby, set the POWER switch to OFF (CHG) and then back to CAMERA. However, your camcorder does not turn off automatically while the cassette is not inserted.

When you record in the SP and LP modes on one tape or you record in the LP mode

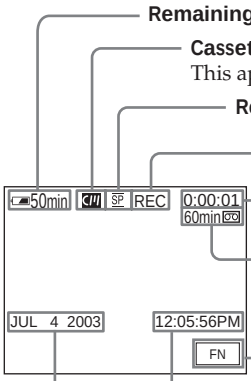
- The transition between scenes may not be smooth.
- The playback picture may be distorted or the time code may not be written properly between scenes.

Note on the LOCK switch

When you slide the LOCK switch to the right, the POWER switch can no longer be set to MEMORY accidentally. The LOCK switch is set to the left as the default setting.

Indicators displayed during recording

Indicators are not recorded on the tape.



Remaining battery time

Cassette Memory
This appears when using the cassette with Cassette Memory.

Recording mode

STBY/REC

Time code/Tape counter

Remaining tape
This appears after you insert the cassette.

FN button
Press this button to display operation buttons on the LCD screen.

Time
The time appears about five seconds after the power is turned on.

Date
The date appears about five seconds after the power is turned on.

Remaining battery time indicator during recording
The remaining battery time indicator roughly indicates the continuous recording time. The indicator may not be correct, depending on the conditions in which you are recording. When you close the LCD panel and open it again, it takes about one minute for the correct remaining battery time in minutes to be displayed.

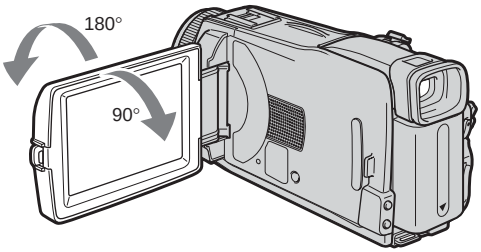
Time code
The time code indicates the recording or playback time, “0:00:00” (hours : minutes : seconds) in CAMERA and “0:00:00:00” (hours : minutes : seconds : frames) in VCR. You cannot rewrite only the time code.

Recording data
The recording data (date/time or various settings when recorded) are not displayed during recording. However, they are recorded automatically on the tape. To display the recording data, press DATA CODE during playback. You can also use the Remote Commander for this operation (p. 39).

After recording

(1) Set the POWER switch to OFF (CHG).
(2) Close the LCD panel.
(3) Eject the cassette.
(4) Remove the power source.

Adjusting the LCD screen



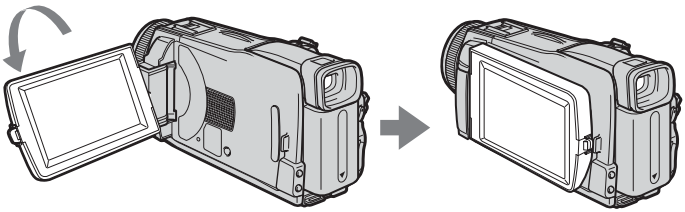
When you adjust the LCD panel, make sure if the LCD panel is opened up to 90 degrees.

Note

When using the LCD screen except in the mirror mode, the viewfinder automatically turns off.

When monitoring on the LCD screen

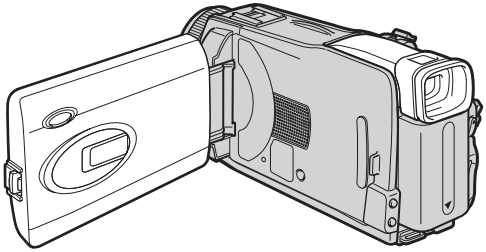
You can turn the LCD panel over and move it back to your camcorder body with the LCD screen facing out.



Shooting with the mirror mode

This feature allows the camera subject to view him-or herself on the LCD screen.
The subject uses this feature to check his or her own image on the LCD screen while you look at the subject in the viewfinder.

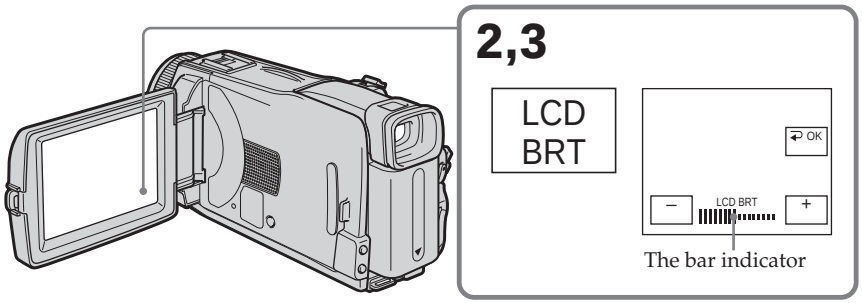
(1) Set the POWER switch to CAMERA or MEMORY.
(2) Rotate the LCD panel 180 degrees.



Picture in the mirror mode
The picture on the LCD screen is a mirror-image. However, the picture will be normal when recorded.

Adjusting the brightness of the LCD screen

(1) When the POWER switch is set to CAMERA, press FN and select PAGE2.
When the POWER switch is set to VCR, press FN to display PAGE1.
When the POWER switch is set to MEMORY, press FN and select PAGE3.
(2) Press LCD BRT. The screen to adjust the brightness of the LCD screen appears.
(3) Adjust the brightness of the LCD screen using – (to dim)/+ (to brighten).
(4) Press ↩ OK to return to PAGE1/PAGE2/PAGE3 in step 1.



To return to FN

Press EXIT.

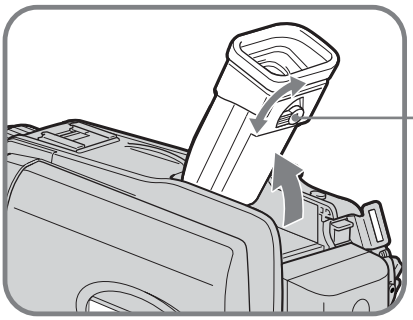
LCD screen backlight
You can change the brightness of the backlight. Select LCD B.L. in the menu settings when using the battery pack (p. 170).

Even if you adjust LCD BRT or LCD B.L.
The recorded picture will not be affected.

Adjusting the viewfinder

If you record pictures with the LCD panel closed, check the picture with the viewfinder. Adjust the viewfinder lens to your eyesight so that the images in the viewfinder come into sharp focus.

Lift up the viewfinder and move the viewfinder lens adjustment lever.



Viewfinder backlight

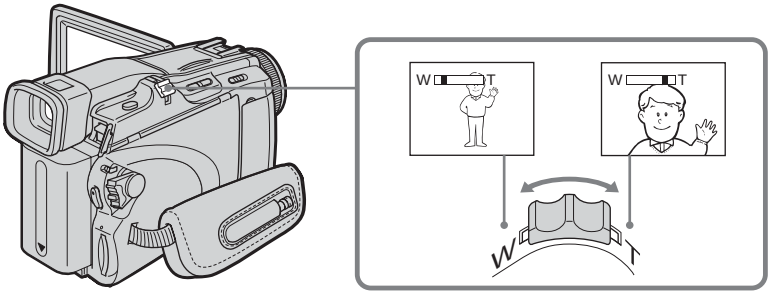
You can change the brightness of the backlight. Select VF B.L. in in the menu settings when using the battery pack (p. 170).

Even if you adjust VF B.L.

The recorded picture will not be affected.

Using the zoom feature

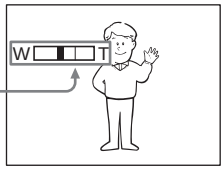
Move the power zoom lever a little for a slower zoom. Move it further for a faster zoom. Using the zoom sparingly results in better-looking recordings.
W : Wide-angle (subject appears farther away)
T : Telephoto (subject appears closer)



To use zoom greater than 10×

Zoom greater than 10× is performed digitally. Digital zoom can be set to 20× or 120×. To activate digital zoom, select the digital zoom power in D ZOOM in C in the menu settings (p. 169). The digital zoom is set to OFF as a default setting.

The right side of the bar shows the digital zooming zone.
The digital zooming zone appears when you select the digital zoom power in the menu settings.



When you shoot close to a subject

If you cannot get a sharp focus, move the power zoom lever to the "W" side until the focus is sharp. You can shoot a subject that is at least about 80 cm (about 2 5/8 feet) away from the lens surface in the telephoto position, or about 1 cm (about 1/2 inch) away in the wide-angle position.

Note on digital zoom

The picture quality deteriorates as you move the power zoom lever towards the "T" side.

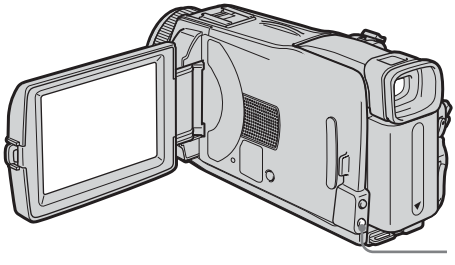
When the POWER switch is set to MEMORY

You cannot use the digital zoom.

Shooting backlit subjects – Back light function

When you shoot a subject with the light source behind the subject or a subject with a light background, use the back light function.

(1) Set the POWER switch to CAMERA or MEMORY.
(2) Press BACK LIGHT.
The indicator appears on the screen.



To cancel the back light function

Press BACK LIGHT again.

When shooting backlit subjects

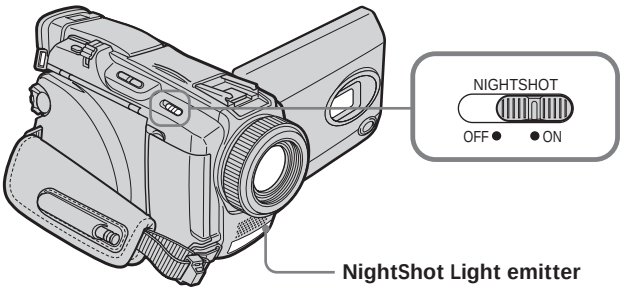
If you press MANUAL of EXPOSURE (p. 60) or SPOT METER (p. 61), the back light function will be canceled.

Shooting in the dark – NightShot/Super NightShot/Color Slow Shutter

Using NightShot

NightShot enables you to shoot a subject in the night or in a dark place.
When recording with NightShot, the picture may be recorded in incorrect or unnatural colors.

(1) Set the POWER switch to CAMERA or MEMORY.
(2) Slide NIGHTSHOT to ON.
The and "NIGHTSHOT" indicators flash on the screen.



To cancel NightShot

Slide NIGHTSHOT to OFF.

Using Super NightShot

Super NightShot makes subjects more than 16 times brighter than those recorded in NightShot.

(1) Set the POWER switch to CAMERA.
(2) Slide NIGHTSHOT to ON.
The and "NIGHTSHOT" indicators flash on the screen.
(3) Press FN and select PAGE3.
(4) Press SUPER NS.
The S indicator lights up on the screen.
(5) Press EXIT to return to FN.

To cancel Super NightShot

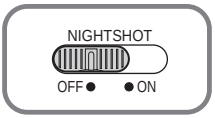
Press SUPER NS again to return to NightShot.

Using the NightShot Light

The picture will be clearer with the NightShot Light on. To enable the NightShot Light, set N.S. LIGHT in to ON in the menu settings. (The default setting is ON.)

Using Color Slow Shutter

Color Slow Shutter enables you to record color images in a dim place.



(1) Set the POWER switch to CAMERA.
(2) Slide NIGHTSHOT to OFF.
(3) Press FN and select PAGE3.
(4) Press COLOR SLW S.
The indicator lights up on the screen.
(5) Press EXIT to return to FN.

To cancel Color Slow Shutter

Press COLOR SLW S again to make the indicator disappear.

Notes

- Do not use NightShot in bright places (e.g. the outdoors in the daytime). This may cause a malfunction.
- If focusing is difficult during recording with NightShot, focus manually.

While using NightShot, you cannot use the following functions:

– White balance
– PROGRAM AE
– Manual exposure
– Flexible Spot Meter

While using Super NightShot or Color Slow Shutter

The shutter speed is automatically adjusted depending on the brightness. At this time, the motion of the picture may slow down.

While using Super NightShot, you cannot use the following functions:
– White balance
– Fader
– Digital effect
– PROGRAM AE
– Manual exposure
– Flexible Spot Meter

When the POWER switch is set to MEMORY
You cannot use the following functions:
– Super NightShot
– Color Slow Shutter

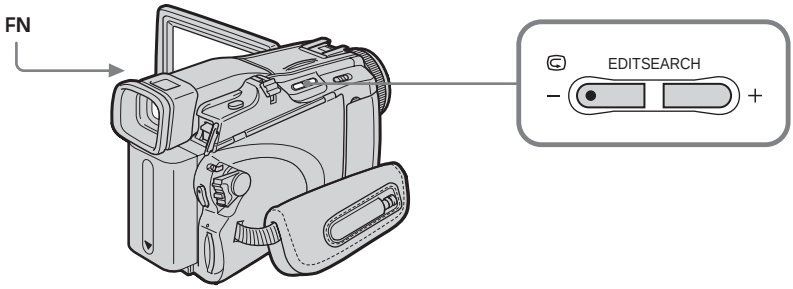
NightShot Light
The NightShot Light rays are infrared and so are invisible. The maximum shooting distance using the NightShot Light is about 3 m (10 feet).

While using Color Slow Shutter, you cannot use the following functions:
– Fader
– Digital effect
– PROGRAM AE
– Manual exposure
– Flexible Spot Meter

In total darkness
Color Slow Shutter may not work normally.

Checking recordings – End search/Edit search/Rec Review

You can use these buttons to check the recorded picture or shoot so that the transition between the last recorded scene and the next scene you record is smooth.



End search

You can go to the end of the recorded section after you record.

(1) Set the POWER switch to CAMERA.
(2) Press FN to display PAGE1.
(3) Press END SCH.
The last five seconds of the recorded section are played back and your camcorder returns to standby.

To return to FN

Press EXIT.

To cancel end search

Press END SCH again.

End search

When you use the cassette without Cassette Memory, end search does not work once you eject the cassette after you have recorded on the tape. If you use a cassette with Cassette Memory, end search works even once you eject the cassette.

If the tape has a blank portion between recorded portions

End search may not work correctly.

Edit search

You can search for the next recording start point. You cannot monitor the sound.

(1) Set the POWER switch to CAMERA.
(2) Hold down the EDITSEARCH. The recorded portion is played back. Release EDITSEARCH to stop playback. If you press START/STOP, recording begins from the point you released EDITSEARCH.

⏪ – : To go backwards
\+ : To go forwards

Rec Review

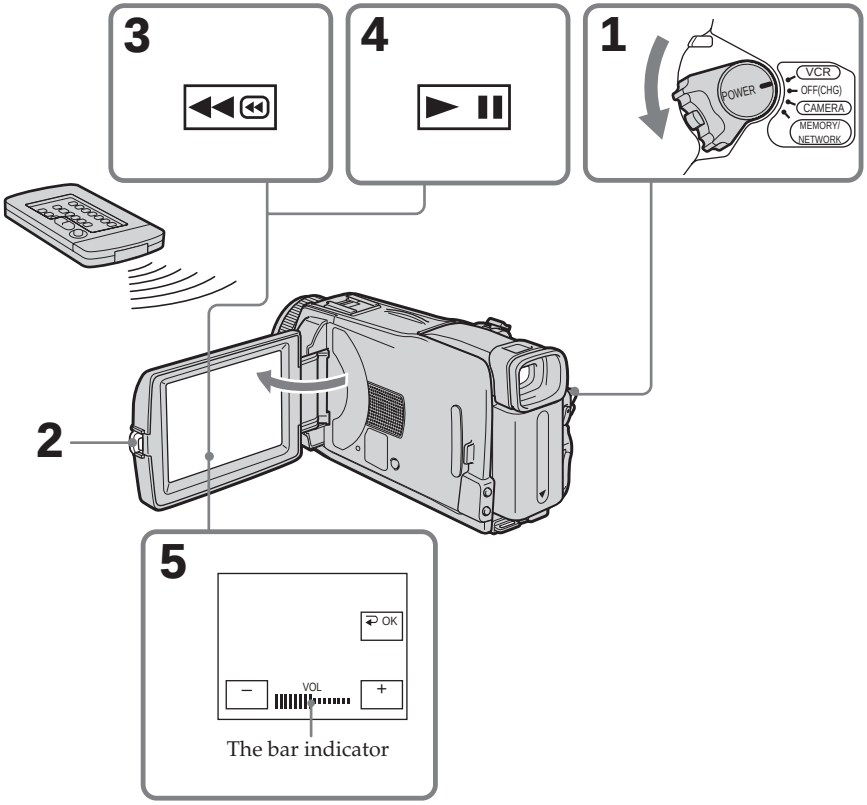
You can check the last recorded section.

(1) Set the POWER switch to CAMERA.
(2) Press the ⏪ – side of EDITSEARCH momentarily. The section you have stopped most recently will be played back for a few seconds, and then your camcorder will return to standby.

Playing back tape

You can monitor the recorded tape on the LCD screen. If you close the LCD panel, you can monitor the playback picture in the viewfinder. You can also control playback using the Remote Commander supplied with your camcorder.

(1) Set the POWER switch to VCR while pressing the small green button.
(2) Press OPEN to open the LCD panel.
(3) Press ◀◀ to rewind the tape.
(4) Press ▶II to start playback.
(5) Adjust the volume following the steps below.
① Press FN to display PAGE1.
② Press VOL. The screen to adjust volume appears.
③ Press – (to turn down the volume)/+ (to turn up the volume).
④ Press ↩ OK to return to PAGE1.



To return to FN
Press EXIT.

To cancel playback
Press ■.

To rewind the tape
Press ◄◄ during playback stop.

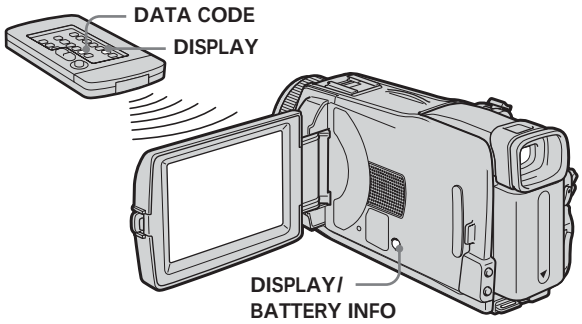
To fastforward the tape
Press ►► during playback stop.

To view a still image (playback pause)
Press ►II during playback. To resume playback, press ►II again.

If you leave the power on for a long time
Your camcorder gets warm. This is not a malfunction.

To display the screen indicators – Display function

Press DISPLAY/BATTERY INFO on your camcorder or DISPLAY on the Remote Commander supplied with your camcorder.
The indicators disappear from the screen.
To make the indicators appear, press DISPLAY/BATTERY INFO or DISPLAY on the Remote Commander again.



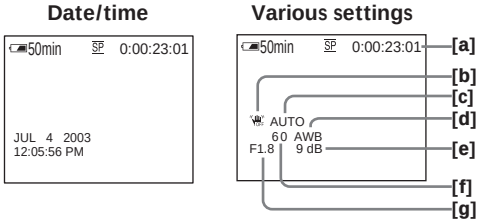
Note
Even if you press DISPLAY on the Remote Commander with the POWER switch set to OFF(CHG), the BATTERY INFO indicator is not displayed.

About date/time and various settings

Your camcorder automatically records not only images on the tape but also the recording data (date/time or various settings when recorded) **(Data code)**.
Follow the steps below to display the data code using the touch panel or the Remote Commander.

Using the touch panel

(1) Set the POWER switch to VCR, then play back the tape.
(2) During playback, press FN and select PAGE2.
(3) Press DATA CODE.
(4) Select CAM DATA or DATE DATA, then press ↩ OK.
(5) Press EXIT.



[a] Tape counter
[b] SteadyShot off
[c] Exposure
[d] White balance
[e] Gain
[f] Shutter speed
[g] Aperture value

Using the Remote Commander

Press DATA CODE on the Remote Commander during playback.
The display changes as follows:
date/time → various settings (SteadyShot off, exposure, white balance, gain, shutter speed, aperture value) → (no indicator)

Various settings

Various settings shows your camcorder's recording information at the time of recording. During tape recording standby, the various settings will not be displayed.

When you use data code, bars (-- -- --) appear if:

– A blank portion of the tape is being played back.
– The tape is unreadable due to tape damage or noise.
– The tape was recorded by a camcorder without the date and time set.

Data code

When you connect your camcorder to a TV, the data code also appears on the TV screen.

Various playback modes

To operate video control buttons, set the POWER switch to VCR.

Using the touch panel

(1) Press FN and select PAGE3.
(2) Press V SPD PLAY to display video control buttons.

To change the playback direction

Press [◄II<] during playback to reverse the playback direction.[1)]

To locate a scene while monitoring the picture (picture search)

Keep pressing [◄◄] or [►►] during playback. To resume normal playback, release the button.

To monitor the high-speed picture while fastforwarding or rewinding the tape (skip scan)

Keep pressing [►►] while fastforwarding or [◄◄] while rewinding the tape. To resume fastforwarding or rewinding, release the button.

To view the picture at slow speed (slow playback)

Press [I►] during playback. For slow playback in the reverse direction, press [◄II<], then press [I►].[1)]

To view the picture at double speed

Press [×2] during playback. For double speed playback in the reverse direction, press [◄II<], then press [×2].[1)]

To view the picture frame-by-frame

Press [>II►] during playback pause.[2)]
For frame-by-frame playback in the reverse direction, press [◄II<].[2)]

To search the last scene recorded (END SEARCH)

Press END SCH on PAGE1 during stop. The last five seconds of the recorded section are played back then your camcorder stops.

[1)] Press [► II] to pause playback. Press [► II] to resume normal playback.
[2)] Press [► II] to resume normal playback.

Video control buttons

Marks on your camcorder are different from those on the Remote Commander supplied with your camcorder.

On your camcorder:

- ▶ II To play back or pause the tape
- ■ To stop the tape
- ◀◀ To rewind the tape
- ▶▶ To fastforward the tape
- I▶ To play back the tape slowly
- >II▶ To forward one frame at a time
- ◀II< To rewind one frame at a time
- ×2 To play back the tape at double speed

On the Remote Commander:

- ▶ To play back the tape
- II To pause the tape
- ■ To stop the tape
- ◀◀ To rewind the tape
- ▶▶ To fastforward the tape
- I▶ To play back the tape slowly
- >II▶ To forward one frame at a time
- ◀II< To rewind one frame at a time
- ×2 To play back the tape at double speed

In the various playback modes

- Sound is muted.
- The previous picture may remain as a mosaic image during playback.

When playback pause lasts for five minutes

Your camcorder automatically enters the stop mode. To resume playback, press ▶ II.

When you play back the tape in reverse

Horizontal noise may appear at the center, or the top and bottom of the screen. This is not a malfunction.

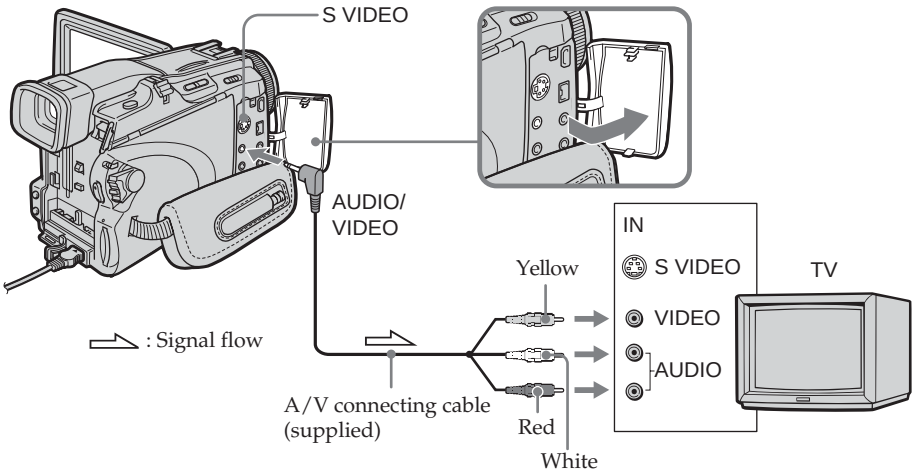
Slow playback

Slow playback can be performed smoothly on your camcorder. However, this function does not work for an output signal from the i.LINK DV Interface.

Viewing a recording on TV

Connect your camcorder to a TV with the A/V connecting cable supplied with your camcorder to watch the playback pictures on the TV screen. You can operate the playback control buttons in the same way as when you view playback pictures on the LCD screen.
When viewing the playback picture on the TV screen, we recommend that you power your camcorder from a wall outlet using the AC Adaptor. Refer to the operating instructions of your TV.

Open the jack cover. Connect your camcorder to the TV with the A/V connecting cable. Then set the TV/VCR selector on the TV to VCR to be able to view images from your camcorder.



If your TV is already connected to the VCR

Connect your camcorder to the LINE IN input on the VCR with the A/V connecting cable supplied with your camcorder. Set the input selector on the VCR to LINE.

If your TV or VCR is a monaural type

Connect the yellow plug of the A/V connecting cable to the video input jack and the white or the red plug to the audio input jack on the VCR or the TV.
If you connect the white plug, the sound is L (left) signal. If you connect the red plug, the sound is R (right) signal.

If the device you want to connect to has an S video jack

- Pictures can be reproduced more faithfully by using an S video cable (optional). With this connection, you do not need to connect the yellow (video) plug of the A/V connecting cable.
  Connect the S video cable (optional) to the S video jacks on both your camcorder and the device you want to connect to.
  This connection produces higher quality DV format pictures.
- There is no sound output when connecting only with an S video cable (optional).

To display the screen indicators on TV

Set DISPLAY to V-OUT/LCD in ETC in the menu settings (p. 176). To make the screen indicators disappear, press DISPLAY/BATTERY INFO on your camcorder.

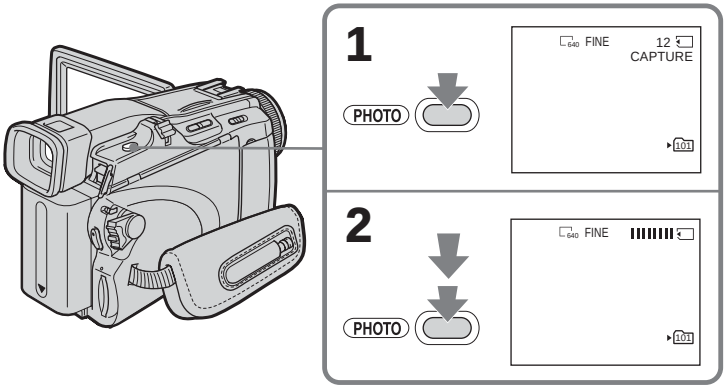
Recording still images on “Memory Stick” during tape recording standby or tape recording

During tape recording standby

The POWER switch should be set to CAMERA.

(1) Keep pressing PHOTO lightly until a still image appears. The CAPTURE indicator appears. Recording does not start yet. To change the still image, release PHOTO, select a still image again, then press and hold PHOTO lightly.

(2) Press PHOTO deeply.
Recording is complete when the bar scroll indicator disappears.
The image displayed on the screen when you pressed PHOTO deeply will be recorded on the “Memory Stick.”



During tape recording

The POWER switch should be set to CAMERA.

Press PHOTO deeply.
The image displayed on the screen when you pressed PHOTO deeply will be recorded on the “Memory Stick.”
Recording on the “Memory Stick” is complete when the bar scroll indicator disappears.

Note

You cannot record still images on the "Memory Stick" during following operations (The indicator flashes):
– End search
– Wide mode
– During fading in with BOUNCE
– MEMORY MIX

"Memory Stick"

See page 99 for details.

Still images

- The image size will be 640 × 480.
- If the POWER switch is set to CAMERA, image quality cannot be changed. Images will be recorded with image quality as set when the POWER switch is set to MEMORY.
- When recording with higher image quality, use of Memory Photo recording is recommended (p. 106).

During and after recording still images on the "Memory Stick"

Your camcorder continues recording on the tape.

When you press PHOTO on the Remote Commander

Your camcorder immediately records the image that is on the screen when you press the button.

To record still images on the "Memory Stick" during tape recording

You cannot check an image on the screen by pressing PHOTO lightly. The image when you press PHOTO deeply will be recorded on the "Memory Stick."

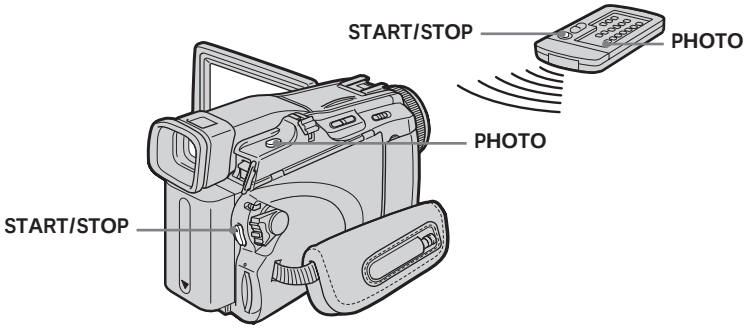
Title

You cannot record the titles.

Self-timer recording

During recording standby, you can record still images on the "Memory Stick" with the self-timer. See page 47 for details.

Self-timer recording



Recording on the tape

The POWER switch should be set to CAMERA.
Operate by touching the panel.

(1) During standby, press FN and select PAGE2.
(2) Press SELFTIMER.
The ⏲ (self-timer) indicator appears on the screen.
(3) Press EXIT to return to FN.
(4) Press START/STOP.
The self-timer starts counting down from about 10 while beeping. In the last two seconds of the countdown, the beep gets faster, then recording starts automatically.

Recording still images on the "Memory Stick" during recording standby

The POWER switch should be set to CAMERA.
Operate by touching the panel.

(1) Follow the step 1 to 3 in "Recording on the tape."
(2) Press PHOTO deeply.
The self-timer starts counting down from about 10 while beeping. In the last two seconds of the countdown, the beep gets faster, then the recording starts automatically.

To stop the countdown for recording on the tape

Press START/STOP. To restart the countdown, press START/STOP again.

To cancel the self-timer

With your camcorder during standby, press SELFTIMER and the ⏲ (self-timer) indicator disappears from the screen. You cannot cancel the self-timer using the Remote Commander.

Notes

- The self-timer recording is automatically canceled when self-timer recording is finished.
- You can record using the self-timer only during recording standby.

When the POWER switch is set to MEMORY

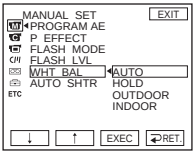
You can also record still images onto the "Memory Stick" with the self-timer (p. 118).

Adjusting the white balance manually

Normally white balance is automatically adjusted.

The POWER switch should be set to (CAMERA) or (MEMORY).
Operate by touching the panel.

(1) Press FN to display PAGE1.
(2) Press MENU to display the menu.
(3) Select WHT BAL in M, then press EXEC (p. 168).



(4) Select a desired mode, then press EXEC.

HOLD:
When recording a single-colored subject or background

OUTDOOR (☀):
- When recording a sunset/sunrise, just after sunset, just before sunrise, neon signs, or fireworks
- Under a color matching fluorescent lamp

INDOOR (☼):
- When lighting conditions change quickly
- In too bright places such as photography studios
- Under sodium lamps or mercury lamps

To return to FN

Press EXIT.

To return to the automatic white balance

Set WHT BAL to AUTO in the menu settings.

If the picture is being taken in a studio lit by TV lighting
We recommend that you record in the INDOOR mode.

When you record under fluorescent lighting
Select AUTO or HOLD.
Your camcorder may not adjust the white balance correctly in the INDOOR mode.

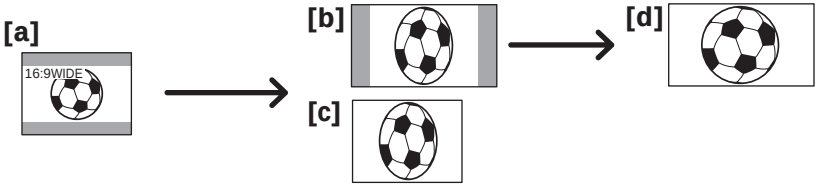
In the AUTO mode
Point your camcorder at the white subject for about 10 seconds after setting the POWER switch to CAMERA to get better adjustment when:
– You remove the battery pack for replacement.
– You bring your camcorder from indoors to outdoors holding the exposure, or vice versa.

In the HOLD mode
Set WHT BAL to AUTO and reset to HOLD after few seconds when:
– You change the mode of PROGRAM AE.
– You bring your camcorder from indoors to outdoors, or vice versa.

Using the wide mode

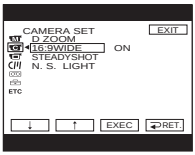
If you move the power zoom lever to "W" side, you can record with a wider angles than normal tape recording.
You can record a 16:9 wide picture to watch on the 16:9 wide-screen TV (16:9WIDE). Black bands appear on the screen during recording in the 16:9WIDE mode **[a]**. The picture during playing back in the 4:3 mode on a wide-screen TV **[b]** or a normal TV **[c]*** are compressed in the widthwise direction. If you set the screen mode of the wide-screen TV to the full mode, you can watch pictures of normal images **[d]**.

* The picture played back in the wide mode on a normal TV appears the same as the picture played back in the wide mode on your camcorder **[a]**.



The POWER switch should be set to (CAMERA).
Operate by touching the panel.

(1) During recording standby, press FN to display PAGE1.
(2) Press MENU to display the menu.
(3) Select 16:9WIDE in , then press EXEC (p. 169).
(4) Select ON, then press EXEC.



To return to FN
Press EXIT.

To cancel the wide mode
Set 16:9WIDE to OFF in the menu settings.

Notes

- In the wide mode, you cannot operate the following functions:
  - Recording still images on the "Memory Stick" during tape recording or tape recording standby
  - BOUNCE
  - OLD MOVIE
- Pictures recorded on the tape in wide mode cannot be returned to normal size.

Connection for a TV

Pictures recorded in the 16:9WIDE mode automatically appear on the TV screen at full size when:

- You connect your camcorder to a TV that is compatible with the video ID (ID-1/ID-2) system.
- You connect your camcorder to the S video jack on a TV.

ID-1 system

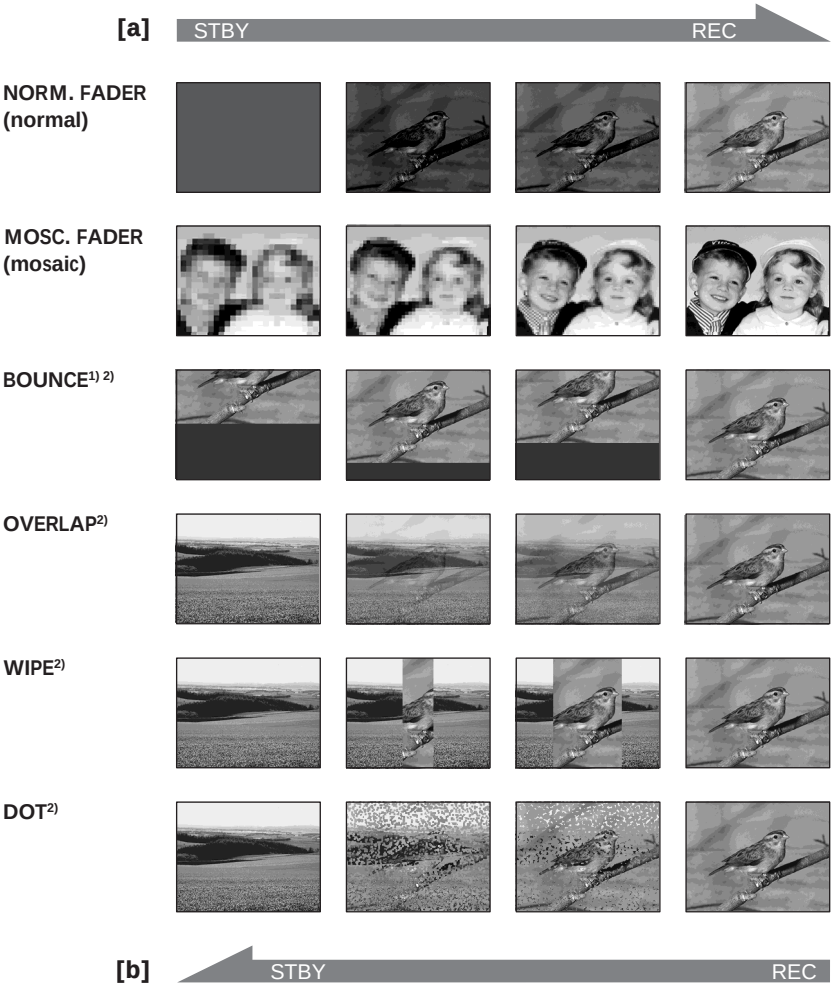
The ID-1 system sends aspect ratio information (16:9, 4:3, or letter box) with video signals. If you connect a TV compatible with the ID-1 system, the screen size is automatically selected.

ID-2 system

The ID-2 system sends a copyright protection signal with ID-1 signals inserted between video signals when you connect your camcorder to other equipment using the A/V connecting cable.

Using the fader function

You can fade in or out to give your recording a professional appearance.



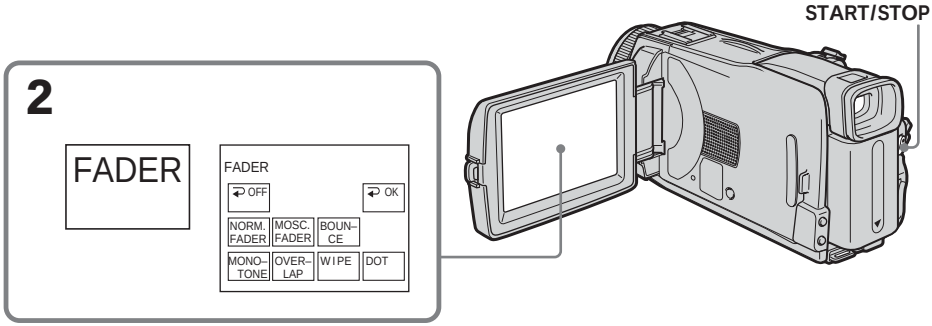
MONOTONE
When fading in, the picture gradually changes from black-and-white to color.
When fading out, the picture gradually changes from color to black-and-white.

1) You can use BOUNCE when D ZOOM in is set to OFF in the menu settings.
2) You can fade in only.

Using the fader function

The POWER switch should be set to CAMERA.
Operate by touching the panel.

(1) When fading in [a]
Press FN to display PAGE1 during recording standby.
When fading out [b]
Press FN to display PAGE1 during recording.
(2) Press FADER. The screen to select the fader mode appears.
(3) Press a desired mode.
(4) Press ⮌ OK to return to PAGE1.
(5) Press EXIT to return to FN.
The fader indicator you selected flashes.
(6) Press START/STOP.
After the fade in/out is carried out, your camcorder automatically returns to the normal mode.



To cancel the fade in/out

Before pressing START/STOP, press ⮌ OFF to return to PAGE1.

Note

You cannot use the following functions while using fader. Also, you cannot use fader while using following functions:
– Super NightShot
– Color Slow Shutter
– Digital effect
– Interval Recording
– Frame recording

When you select OVERLAP, WIPE or DOT

Your camcorder automatically stores the image recorded on the tape. As the image is being stored, the indicator becomes fast flashing, then the playback picture disappears.

During fading in with BOUNCE, you cannot use the following functions:

– Zoom
– Recording still images on the "Memory Stick"
– Picture effect
– PROGRAM AE
– Manual exposure
– Flexible Spot Meter
– Manual focus

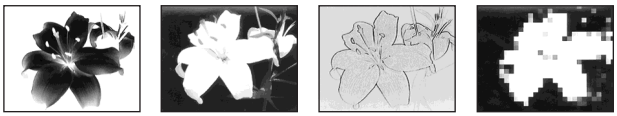
Note on the BOUNCE mode

You cannot select BOUNCE in the followings:
– D ZOOM is activated in the menu settings
– Wide mode
– Picture effect
– PROGRAM AE

Using special effects – Picture effect

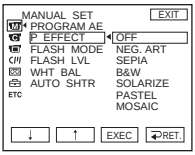
NEG. ART [a] : The color and brightness of the picture are reversed.
SEPIA : The picture is sepia.
B&W : The picture is monochrome (black-and-white).
SOLARIZE [b] : The picture looks like an illustration with a strong contrast.
PASTEL [c] : The picture looks like a pale pastel drawing.
MOSAIC [d] : The picture is mosaic.

[a] **[b]** **[c]** **[d]**



The POWER switch should be set to CAMERA.
Operate by touching the panel.

(1) Press FN to display PAGE1.
(2) Press MENU to display the menu.
(3) Select P EFFECT in M, then press EXEC (p. 168).



(4) Select a desired mode, then press EXEC.

To return to FN

Press EXIT.

To cancel picture effect

Set P EFFECT to OFF in the menu settings.

Note

While using picture effect, you cannot use following functions:
– BOUNCE
– OLD MOVIE

Using special effects – Digital effect

STILL
You can record a still image so that it is superimposed on a moving picture.

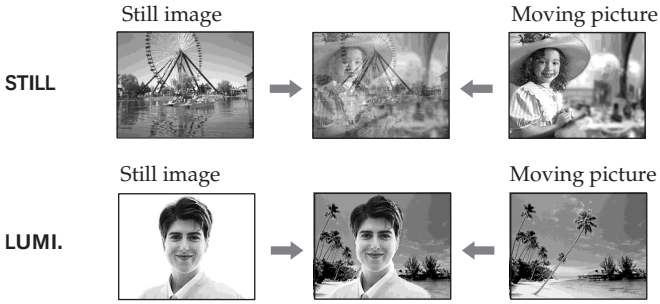
FLASH (flash motion)
You can record still images successively at regular intervals.

LUMI. (luminance key)
You can swap the brighter area in a still image with a moving picture.

TRAIL
You can record a picture so that an incidental image like a trail is left.

SLOW SHTR (slow shutter)
You can slow down the shutter speed. The SLOW SHTR mode is good for recording dark pictures more brightly.

OLD MOVIE
You can add an old movie type atmosphere to pictures. Your camcorder automatically sets the 16:9WIDE mode, picture effect to SEPIA, and the appropriate shutter speed.



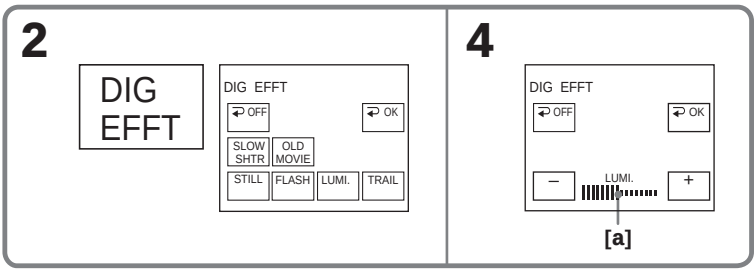
The POWER switch should be set to CAMERA.
Operate by touching the panel.

(1) Press FN and select PAGE2.
(2) Press DIG EFFT. The screen to select a digital effect is displayed.
(3) Press a desired mode. When you select STILL or LUMI., the still image is stored in memory.
(4) Press – (to decrease the effect)/+ (to increase the effect) to adjust the effect.

Items to adjust

STILL	The rate of the still image you want to superimpose on the moving picture
FLASH	The interval of flash motion
LUMI.	The color scheme of the area in the still image which is to be swapped with a moving picture
TRAIL	The vanishing time of the incidental image
SLOW SHTR	Shutter speed. The larger the shutter speed number, the slower the shutter speed.
OLD MOVIE	No adjustment necessary

(5) Press ↩ OK to return to PAGE2.



[a] The bar appears when setting following digital effect modes: STILL, FLASH, LUMI., TRAIL.

To return to FN
Press EXIT.

To cancel digital effect
Press ↩ OFF to return to PAGE2.

Notes

- While using digital effect, you cannot use the following functions:
  – Super NightShot
  – Color Slow Shutter
  – Fader
- PROGRAM AE does not work in the SLOW SHTR mode.
- The following functions do not work in the OLD MOVIE mode:
  – Wide mode
  – Picture effect
  – PROGRAM AE

When recording in the SLOW SHTR mode

Auto focus may not be effective. Focus manually using a tripod.

Shutter speed

Shutter speed number	Shutter speed
SLOW SHTR 1	1/30
SLOW SHTR 2	1/15
SLOW SHTR 3	1/8
SLOW SHTR 4	1/4

SPOTLIGHT[1)]
This mode prevents people's faces, for example, from appearing excessively white when shooting subjects lit by strong light in the theater.

PORTRAIT (soft portrait)
This mode brings out the subject while creating a soft background for subjects such as people or flowers.

SPORTS (sports lesson)[1)]
This mode minimizes shake on fast-moving subjects such as in tennis or golf.

BEACH&SKI[1)]
This mode prevents people's faces from appearing dark in strong light or reflected light, such as at a beach in midsummer or on a ski slope.

SUNSETMOON (sunset & moon)[2)]
This mode allows you to maintain atmosphere when you are recording sunsets, general night views, fireworks displays and neon signs.

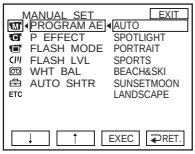
LANDSCAPE[2)]
This mode is for when you record distant subjects such as mountains. Also it prevents your camcorder from focusing on glass or metal mesh in windows when you record a subject behind glass or a screen.

[1)] Your camcorder focuses only on subjects in the middle to far distance.
[2)] Your camcorder focuses only distant subject.

Using PROGRAM AE

The POWER switch should be set to CAMERA or MEMORY.
Operate by touching the panel.

(1) Press FN to display PAGE1.
(2) Press MENU to display the menu.
(3) Select PROGRAM AE in M, then press EXEC (p. 168).



(4) Select a desired mode, then press EXEC.

To return to FN

Press EXIT.

To cancel PROGRAM AE

Set PROGRAM AE to AUTO in the menu settings.

Notes

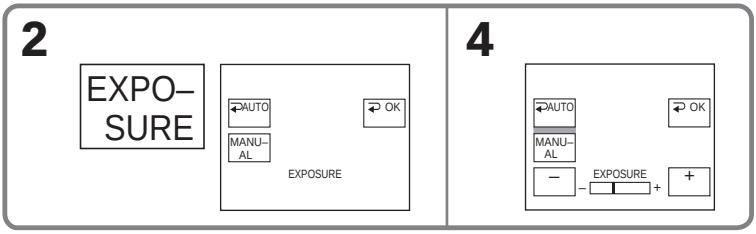
- The following functions do not work in PROGRAM AE:
  – Color Slow Shutter
  – During fading in with BOUNCE
  – SLOW SHTR
  – OLD MOVIE
  – Spot Focus
- PROGRAM AE does not work in the following cases (The indicator flashes):
  – NightShot
  – When the POWER switch is set to MEMORY, you use MEMORY MIX.
- When you set the POWER switch to MEMORY, the SPORTS mode does not work. (The indicator flashes.)

Adjusting the exposure manually

We recommend adjusting the exposure manually in the following cases:
– When the subject is backlit
– When the subject is too bright against the background
– When recording dark pictures (e.g. night scenes) faithfully

The POWER switch should be set to CAMERA or MEMORY.
Operate by touching the panel.

(1) Press FN to display PAGE1.
(2) Press EXPOSURE. The screen to adjust the exposure appears.
(3) Press MANUAL.
(4) Adjust the exposure using – (to dim)/+ (to brighten).
(5) Press ↩ OK to return to PAGE1.



To return to FN

Press EXIT.

To return to the automatic exposure

Press ↩ AUTO to return to PAGE1.

Note

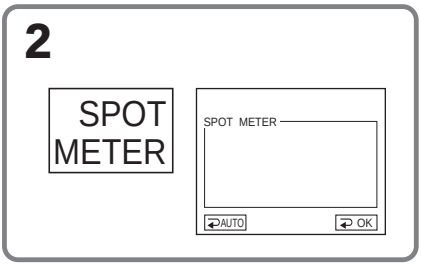
When you adjust the exposure manually, the following functions do not work:
– Back light function
– Color Slow Shutter

Using spot light-metering function – Flexible Spot Meter

You can take a picture with the appropriate exposure automatically for just the point you want to focus on and with its exposure fixed.
Use Flexible Spot Meter in the following cases:
– The subject is backlit.
– When there is strong contrast between the subject and background such as with a subject that is on stage and lit by a spotlight.

The POWER switch should be set to (CAMERA) or (MEMORY).
Operate by touching the panel.

(1) Press FN to display PAGE1.
(2) Press SPOT METER. The SPOT METER screen appears.
(3) Press the desired area in the frame.
The SPOT METER indicator flashes on the screen. The exposure of the point you selected is adjusted.
(4) Press ⮐ OK to return to PAGE1.



To return to FN
Press EXIT.

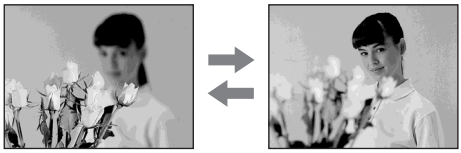
To return to the automatic exposure
Press ⮐ AUTO to return to PAGE1.

Note
The following functions do not work during Flexible Spot Meter:
– Back light function
– Color Slow Shutter
– Spot Focus

Focusing manually

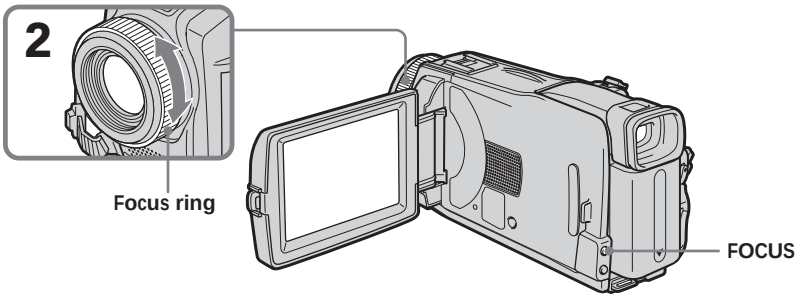
You can gain better results by manually adjusting the focus in the following cases. Normally, focus is automatically adjusted.

- The autofocus mode is not effective when shooting:
  - Subjects through glass coated with water droplets
  - Horizontal stripes
  - Subjects with little contrast with backgrounds such as walls or the sky
- When you want to change the focus from a subject in the foreground to a subject in the background
- Shooting a stationary subject when using a tripod



The POWER switch should be set to CAMERA or MEMORY.

(1) Press FOCUS.
The ☞ (focus) indicator appears on the screen.
(2) Turn the focus ring to sharpen focus.



To return to the autofocus

Press FOCUS to turn off the ☞, ▲ or 👤 indicator.

To focus precisely

It is easier to focus on the subject if you adjust the zoom to shoot at the "W" (wide-angle) position after focusing at the "T" (telephoto) position.

When you shoot close to the subject

Focus at the end of the "W" (wide-angle) position.

☞ changes as follows:

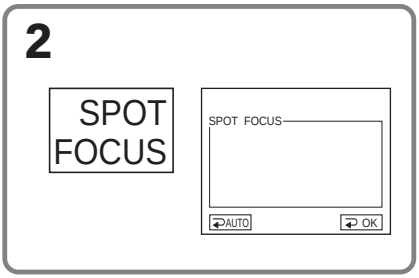
▲ when recording a distant subject
👤 when the subject is too close to focus on

Using spot focus function – Spot Focus

You can take a picture with the appropriate focus automatically for just the point you want to focus on and with its focus fixed.

The POWER switch should be set to CAMERA or MEMORY.
Operate by touching the panel.

(1) Press FN to display PAGE1.
(2) Press SPOT FOCUS. The SPOT FOCUS screen appears.
(3) Press the desired area in the frame.
The SPOT FOCUS indicator flashes on the screen. The focus of the point you selected is adjusted.
(4) Press ↩ OK to return to PAGE1.



To return to FN
Press EXIT.

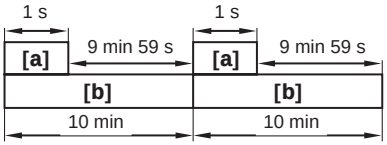
To return to the autofocus
Press ↩ AUTO to return to PAGE1.

Note
The back light function does not work during Spot Focus.

Interval Recording

You can make a time-lapse recording by setting your camcorder to automatically record and standby sequentially. You can achieve an excellent recording for flowering, emergence, etc. with this function.

Example

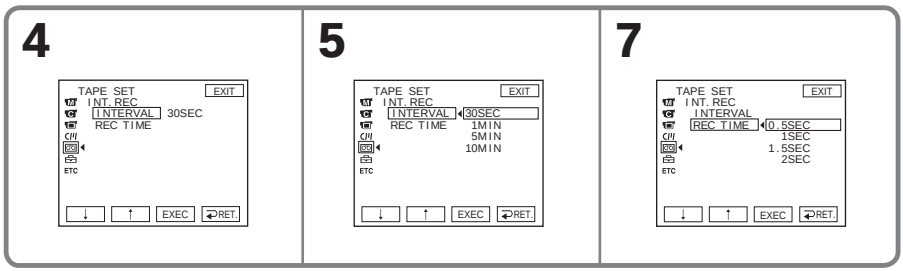


[a] REC TIME
[b] INTERVAL

There may be a discrepancy in recording time of up to +/– six frames from the selected time.

The POWER switch should be set to CAMERA.
Operate by touching the panel.

(1) Press FN to display PAGE1.
(2) Press MENU to display the menu.
(3) Select INT. REC in , then press EXEC (p. 174).
(4) Select SET, then press EXEC.
(5) Select INTERVAL, then press EXEC.
(6) Select a desired interval time, then press EXEC.
The time: 30SEC ⟷ 1MIN ⟷ 5MIN ⟷ 10MIN
(7) Select REC TIME, then press EXEC.
(8) Select a desired recording time, then press EXEC.
The time: 0.5SEC ⟷ 1SEC ⟷ 1.5SEC ⟷ 2SEC
(9) Press ⮌ RET.
(10) Set INT. REC to ON, then press EXEC.
(11) Press EXIT to return to FN.
The INTERVAL TAPE indicator flashes on the screen.
(12) Press START/STOP to start Interval Recording.
The INTERVAL TAPE indicator lights up during Interval Recording.



To cancel Interval Recording

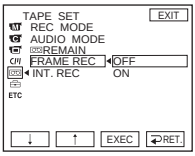
Set INT. REC to OFF in the menu settings.

Frame by frame recording – Frame recording

You can make a recording with a stop-motion animated effect using frame recording. To create this effect, alternately move the subject a little and make frame recording. We recommend that you use a tripod, and operate your camcorder using the Remote Commander after step 6.

The POWER switch should be set to (CAMERA).
Operate by touching the panel.

(1) Press FN to display PAGE1.
(2) Press MENU to display the menu.
(3) Select FRAME REC in [📼], then press EXEC (p. 174).



(4) Select ON, then press EXEC.
(5) Press EXIT to return to FN.
The FRAME REC indicator lights up.
(6) Press START/STOP to start frame recording. Your camcorder makes a recording for about six frames, and returns to recording standby.
(7) Move the subject, and repeat step 6.

To cancel frame recording

Set FRAME REC to OFF in the menu settings.

Note

The proper remaining tape time is not indicated if you use frame recording continuously.

When using frame recording

The last recorded frame is longer than other frames.

Using the viewfinder

Turn the LCD panel over and move it back to your camcorder body with the LCD screen facing out. You can operate with the touch panel using the viewfinder.
Use the viewfinder when operating camera brightness and fader on the touch panel.

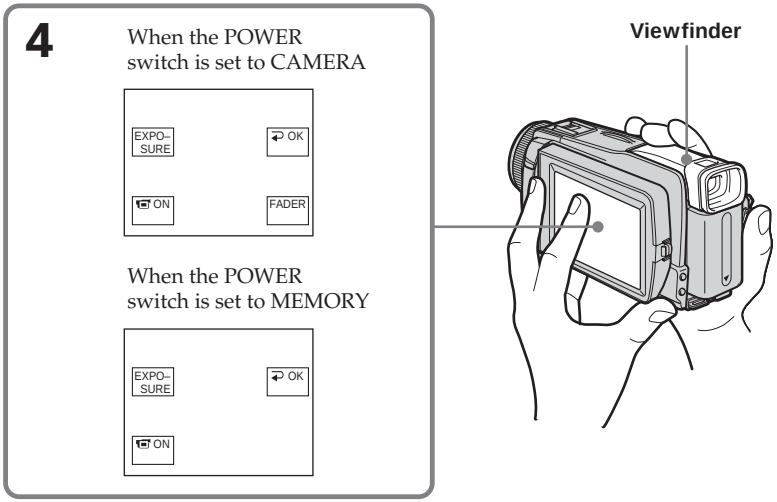
The POWER switch should be set to CAMERA or MEMORY.
Operate by touching the panel.

(1) Turn the LCD panel over and move it back to your camcorder body with the LCD screen facing out.
(2) Press OFF. The PANEL OFF indicator appears on the screen.
(3) Press OK. The LCD screen is turned off.
(4) Using the viewfinder, press the LCD screen. EXPOSURE, OK, ON and FADER (only when the POWER switch is set to CAMERA) appear.
(5) Press the LCD screen and select a desired item, then press OK.

EXPOSURE: Adjust the exposure by pressing –/+.
FADER: Press FADER until a desired fader mode appears.
The indicator changes as follows:

FADER → M. FADER → BOUNCE → MONOTONE → OVERLAP → WIPE → DOT → (no indicator) → FADER

ON: The LCD screen lights up.



To make the buttons on the LCD screen disappear

Press OK.

Note

When the POWER switch is set to VCR or during memory playback, you cannot operate with the touch panel using the viewfinder.

To operate the items that do not appear

Set the LCD panel back to the previous position. Operate the items using the LCD screen.

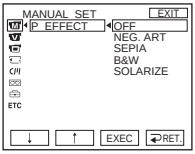
Available recording time

This is the time when you record pictures using the viewfinder (p. 17).

Playing back tape with picture effect

The POWER switch should be set to VCR.
Operate by touching the panel.

(1) During playback or playback pause, press FN to display PAGE1.
(2) Press MENU to display the menu.
(3) Select P EFFECT in M, then press EXEC (p. 168).



(4) Select a desired mode, then press EXEC.
You can use NEG. ART, SEPIA, B&W and SOLARIZE.
See page 54 for details of each mode.

To return to FN

Press EXIT.

To cancel picture effect

Set P EFFECT to OFF in the menu settings.

Notes

- You cannot process externally input scenes using picture effect.
- You cannot record images on the tape on your camcorder while you are processing the image using picture effect. Record images on the "Memory Stick" (p. 110, 119), or on a VCR using your camcorder as a player.

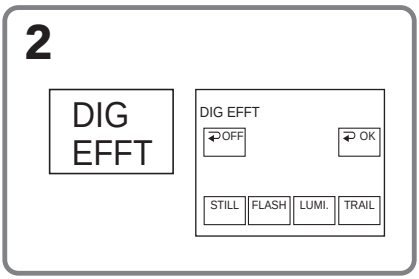
Pictures processed by picture effect

Pictures processed by picture effect are not output through the i.LINK DV Interface.

Playing back tape with digital effect

The POWER switch should be set to (VCR).
Operate by touching the panel.

(1) During playback or playback pause, press FN and select PAGE2.
(2) Press DIG EFFT. The screen to select a digital effect is displayed.
(3) Select a desired mode. You can use STILL, FLASH, LUMI. and TRAIL. See page 55 for details of the each mode.
When you select STILL or LUMI., the picture that you select the mode to is stored in memory as a still image.
(4) Press –/+ to adjust the effect.
(5) Press ↩ OK to return to PAGE2.



To return to FN

Press EXIT.

To cancel digital effect

Press ↩ OFF to return to PAGE2.

Notes

- You cannot process externally input scenes using digital effect.
- You cannot record images on the tape on your camcorder while you are processing the image using digital effect. Record images on the "Memory Stick" (p. 110, 119), or on a VCR using your camcorder as a player.

Pictures processed by digital effect

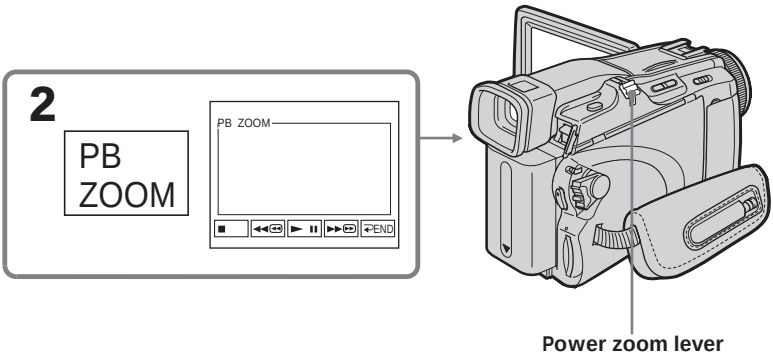
Pictures processed by digital effect are not output through the i.LINK DV Interface.

Enlarging images recorded on tape – Tape PB ZOOM

Besides the operation described here, your camcorder can enlarge still images recorded on the "Memory Stick" (p. 129).

The POWER switch should be set to (VCR).
Operate by touching the panel.

(1) During playback or playback pause, press FN and select PAGE2.
(2) Press PB ZOOM. The PB ZOOM screen appears.
(3) Press the area you want to enlarge in the frame.
The area you pressed moves to the center of the screen, and the playback image is enlarged to about twice the size. If you then press another area, that area moves to the center of the screen.
(4) Adjust the zoom ratio by the power zoom lever.
You can select the zoom ratio from approximately 1.1 times up to 5 times its size.
W: Decrease the zoom ratio.
T : Increase the zoom ratio.



To cancel tape PB ZOOM

Press ↩ END.

Notes

- You cannot process externally input scenes using tape PB ZOOM with your camcorder.
- You cannot record images on the tape on your camcorder while you are processing the image using tape PB ZOOM. However, you can record images on the "Memory Stick" (p. 110), or on a VCR using your camcorder as a player.
- You cannot record moving pictures on the "Memory Stick" on your camcorder when you have processed the picture using tape PB ZOOM.

Images in tape PB ZOOM

Images in tape PB ZOOM are not output through the i.LINK DV Interface.

In tape PB ZOOM

If you press DISPLAY/BATTERY INFO, the frame on the PB ZOOM screen disappears. You cannot move the part you pressed to the center of the screen.

Edge of the enlarged image

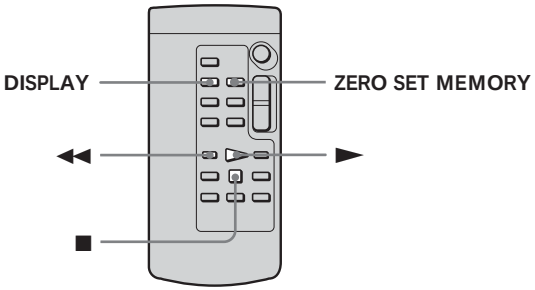
The edge of the enlarged image cannot be displayed at the center of the screen.

Quickly locating a scene – Zero set memory

Your camcorder automatically searches for a desired scene having the tape counter value of "0:00:00." Use the Remote Commander for this operation.

The POWER switch should be set to (VCR).

(1) During playback, press ZERO SET MEMORY on the Remote Commander at the point you want to locate later. The tape counter shows "0:00:00," then starts counting. If the indicators do not appear, press DISPLAY. The ZERO SET MEMORY indicator flashes.
(2) Press ■ when you want to stop playback.
(3) Press ◄◄ to rewind the tape to the tape counter's zero point. The tape stops automatically when the tape counter reaches approximately zero.
(4) Press ►. Playback starts from the counter's zero point.



Notes

- When you press ZERO SET MEMORY before rewinding the tape, the zero set memory function will be canceled.
- There may be a discrepancy of several seconds between the time code and the tape counter.
- The ZERO SET MEMORY indicator disappears when you press FN.

If the tape has a blank portion in the recorded portions

The zero set memory function may not work correctly.

Searching the boundaries of recorded tape by title – Title search

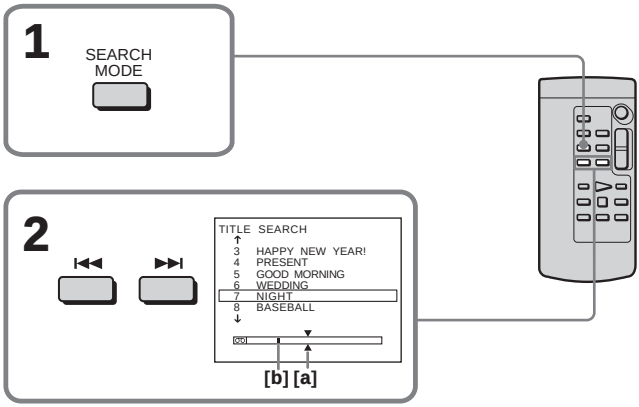
Use the cassette with Cassette Memory for this operation.
Use the Remote Commander for this operation.

Before operation
Set CM SEARCH in [CM] to ON in the menu settings. (The default setting is ON.)

The POWER switch should be set to (VCR).

(1) Press SEARCH MODE on the Remote Commander repeatedly, until the TITLE SEARCH indicator appears.
The title search screen appears.
The indicator changes as follows:
→ TITLE SEARCH → DATE SEARCH → (no indicator) ┐

(2) Press ⏮ or ⏭ on the Remote Commander to select the title for playback.
Your camcorder automatically starts playback of the scene having the title that you selected.



[a] Actual point you are trying to search for
[b] Present point on the tape

To cancel searching

Press ■ on the Remote Commander.

If the tape has a blank portion between recorded portions
Title search may not work correctly.

To superimpose a title
See page 94.

Searching a recording by date – Date search

• DATE SEARCH by using Cassette Memory
  ➔ Cue by selecting the recording date on the screen
• DATE SEARCH without using Cassette Memory
  ➔ Cue to changing point of recording date

Use the Remote Commander for this operation.

Searching for the date by using Cassette Memory

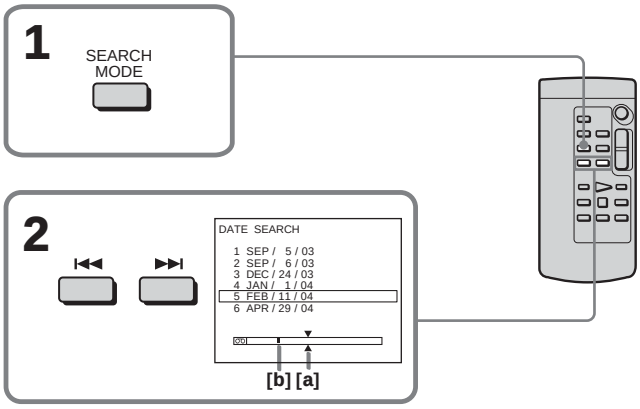
Before operation

• You can use this function only when playing back the cassette with Cassette Memory.
• Set CM SEARCH in [CM] to ON in the menu settings. (The default setting is ON.)

The POWER switch should be set to (VCR).
Operate by touching the panel.

(1) Press SEARCH MODE on the Remote Commander repeatedly, until the DATE SEARCH indicator appears.
The date search screen appears.
The indicator changes as follows:
TITLE SEARCH → DATE SEARCH → (no indicator)

(2) Press ⏮ or ⏭ on the Remote Commander to select the date for playback.
Your camcorder automatically starts playback at the beginning of the selected date.



[a] Actual point you are trying to search for
[b] Present point on the tape

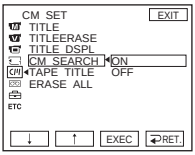
To cancel searching

Press ■ on the Remote Commander.

Searching for the date without using Cassette Memory

The POWER switch should be set to VCR.
Operate by touching the panel.

(1) Press FN to display PAGE1.
(2) Press MENU to display the menu.
(3) Select CM SEARCH in C/II, then press EXEC (p. 173).



(4) Select OFF, then press EXEC.
(5) Press SEARCH MODE on the Remote Commander, until the DATE SEARCH indicator appears.
(6) Press ⏮ on the Remote Commander to search for the previous date or press ⏭ on the Remote Commander to search for the next date. Your camcorder automatically starts playback at the point where the date changes. Each time you press ⏮ or ⏭, your camcorder searches for the previous or next date.

To cancel searching

Press ■ on the Remote Commander or ■ on your camcorder.

Note

If one day's recording is less than two minutes, your camcorder may not accurately find the point where the recording date changes.

If the tape has a blank portion between recorded portions

Date search may not work correctly.

Cassette Memory

The cassette with Cassette Memory can hold six recording date data. If you search the date among seven or more data, see "Searching for the date without using Cassette Memory."

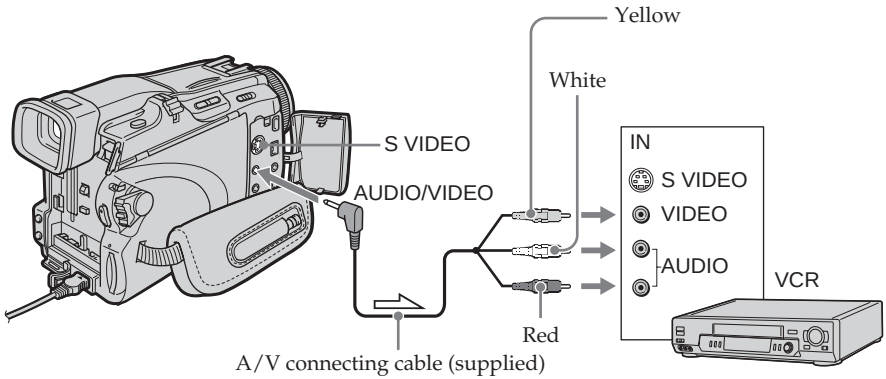
Dubbing tape

You can dub or edit on the VCR connected to your camcorder using your camcorder as a player.
You can connect either the A/V connecting cable (supplied) or i.LINK cable (optional). If you connect with the i.LINK cable (optional), video and audio signals are transmitted in digital form for high-quality editing.
Titles, screen indicators, Cassette Memory contents, and "Memory Stick" index screen lettering cannot be recorded.

Connecting to the VCR

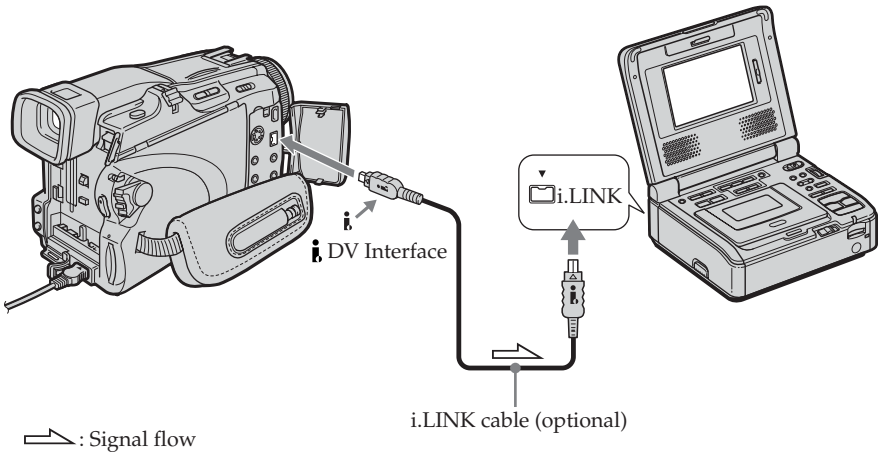
You can edit on VCRs that support the following systems:
8 mm 8, Hi8 Hi8, Digital8 8, VHS VHS, S-VHS S-VHS, VHSC VHSC, S-VHSC S-VHSC, Betamax B, ED Betamax ED Beta, mini DV Mini DV, DV DV or MICROMV MICROMV

Connecting with the A/V connecting cable



: Signal flow

Connecting with the i.LINK cable



: Signal flow

Dubbing a tape

Before operation for connecting with the A/V connecting cable

- Set DISPLAY in ETC to LCD in the menu settings. (The default setting is LCD.)
- Press the following buttons to make the indicator disappear so that they will not be superimposed on the edited tape:
  On your camcorder:
  DISPLAY/BATTERY INFO, DATA CODE
  On the Remote Commander:
  DISPLAY, DATA CODE, SEARCH MODE

The POWER switch should be set to (VCR).

(1) Insert the blank tape (or the tape you want to record over) into the VCR, and insert the recorded tape into your camcorder.
(2) Prepare the VCR for recording. If the VCR has an input selector, set it to input mode.
Refer to the operating instructions of the VCR.
(3) Play back the recorded tape on your camcorder.
(4) Start recording on the VCR.
Refer to the operating instructions of your VCR.

When you have finished dubbing the tape

Press ■ on both your camcorder and the VCR.

If your VCR is a monaural type

Connect the yellow plug of the A/V connecting cable to the video input jack and the white or the red plug to the audio input jack on the VCR or the TV. When the white plug is connected, the left channel audio is output, and when the red plug is connected, the right channel audio is output.

If your VCR has an S video jack

See page 44 for details.

About i.LINK

See page 194 for details.

Pictures processed by picture effect, digital effect or PB ZOOM

These are not output through the i, DV Interface.

If you record a paused playback picture

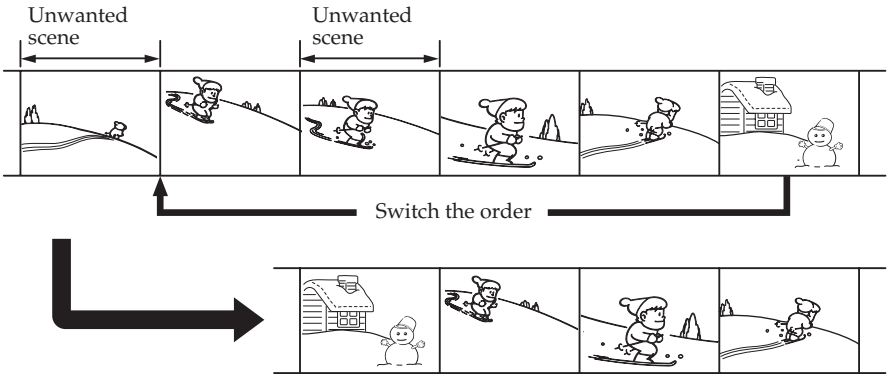
- The recorded picture becomes rough with the i, DV Interface.
- The picture may jitter when you play back the picture using other video equipment.

If you connect with the i.LINK cable

Recording of only the picture or sound cannot be done.

Dubbing only desired scenes – Digital program editing (on tape)

You can duplicate selected scenes (programs) for editing onto the tape without operating the VCR.
Scenes can be selected by frame. You can set up to 20 programs.
Your camcorder can dub on the "Memory Stick." See page 121 for details.



Before operating Digital program editing on the tape recorded on other equipment

Step 1 Connecting to the VCR (p. 77).
Step 2 Setting the VCR to operate (p. 78).
Step 3 Adjusting the synchronization of the VCR (p. 81).

When you dub using the same VCR again, you can skip step 2 and 3.

Using Digital program editing on the tape recorded on other equipment

Operation 1 Making a program (p. 83).
Operation 2 Performing Digital program editing (Dubbing the tape) (p. 85).

Note
When editing digital video, the operation signals to the VCR cannot be sent with LANC jack.

Step 1: Connecting to the VCR

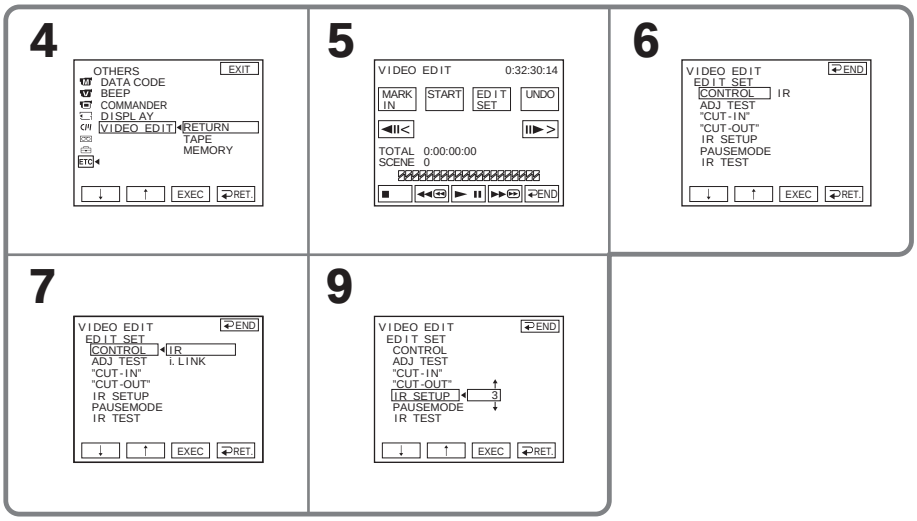
You can connect either the A/V connecting cable or the i.LINK cable.
Connect the devices as illustrated on page 75.

Step 2: Setting the VCR to operate

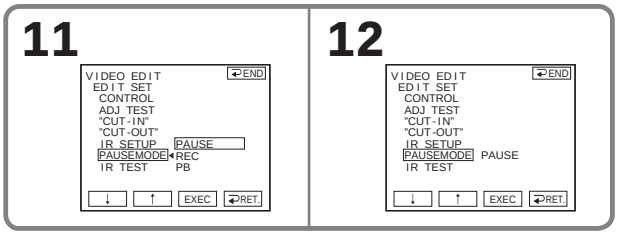
To connect using the A/V connecting cable, send the control signal by infrared rays to the remote sensor on the VCR.

The POWER switch should be set to VCR.
Operate by touching the panel.

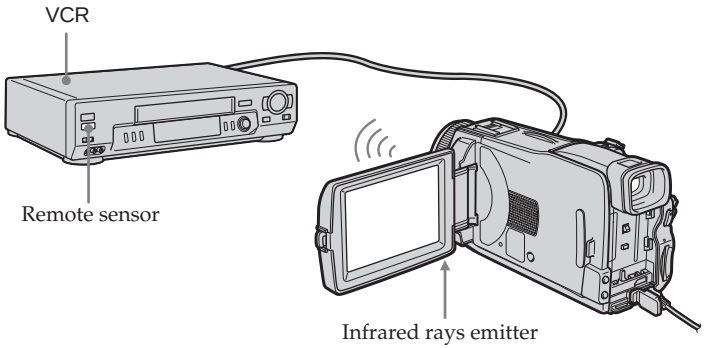
(1) Turn the power of the connected VCR on.
If the VCR has an input selector, set it to input mode.
When you connect a video camera recorder, set its power switch to VCR/VTR.
(2) Press FN to display PAGE1.
(3) Press MENU to display the menu.
(4) Select VIDEO EDIT in ETC, then press EXEC (p. 177).
(5) Select TAPE, then press EXEC.
(6) Press EDIT SET.
(7) Select CONTROL, then press EXEC.
(8) When connecting with the A/V connecting cable, select IR, then press EXEC.
When connecting with the i.LINK cable, select i.LINK, press EXEC, then go to "Step 3: Adjusting the synchronization of the VCR" on page 81.
(9) Select IR SETUP, then press EXEC.
(10) Select the IR SETUP code of your VCR, then press EXEC. Check the code in "About the IR SETUP code" (p. 80).



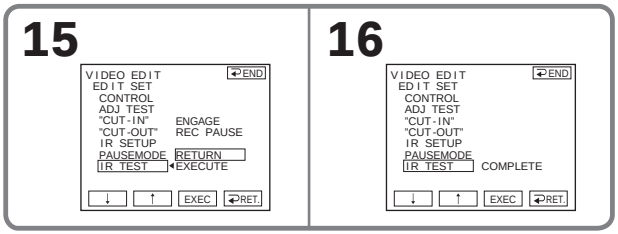
(11) Select PAUSEMODE, then press EXEC.
(12) Select the mode to cancel recording pause on the VCR, then press EXEC.
The correct button depends on your VCR.
Refer to the operating instructions of your VCR.



(13) Locate the infrared rays emitter of your camcorder and face it towards the remote sensor of the VCR about 30 cm (12 in.) apart.



(14) Insert the recordable tape into the VCR, then set the VCR to recording pause.
(15) Select IR TEST, then press EXEC.
(16) Select EXECUTE, then press EXEC.
If the VCR starts recording, the setting is correct.
The indicator you selected to cancel recording pause on the VCR flashes on the screen. When finished, the indicator changes to COMPLETE.



Note

When you connect with an i.LINK cable, you may not be able to operate the dubbing function correctly, depending on the VCR.
Set CONTROL to IR in the menu settings of your camcorder.

About the IR SETUP code

The IR SETUP code is stored in the memory of your camcorder. Be sure to set the correct code, depending on your VCR. Default setting is code number 3.

Brand	IR SETUP code
Sony	1, 2, 3, 4, 5, 6
Admiral (M. Wards)	89
Aiwa	47, 54, 80
Akai	49, 51
Audio Dynamic	21, 35
Bell&Howell (M. Wards)	36
Broksonic	21, 70, 82
Canon	77, 78
Citizen	47
Craig	47, 73
Curtis Mathis	8, 77, 80
Daewoo	26, 40, 77
DBX	21, 33, 35
Dimensia	8
Emerson	26, 48, 59, 70, 80, 81, 82
Fisher	36, 37, 44, 45
Funai	80
General Electric	8, 32*, 77, 94*, 101
Goldstar/LG	47
GO VIDEO	71
Hitachi	8, 42, 78
HQ	40
Instant Replay	77, 78
JC Penny	8, 21, 33, 35, 36, 42, 77
JVC	12, 13, 14, 21, 33, 35
Kenwood	21, 33, 35, 47
LXI (Sears)	36, 37, 42, 44, 45, 47, 49, 80
Magnavox	17, 77, 78, 83
Marantz	21, 33, 35
Marta	47
Memorex	37, 77
Minolta	8, 42

Brand	IR SETUP code
Mitsubishi/MGA	22, 23, 24, 28, 29
Multitech	23, 32, 80
NEC	21, 33, 35
Olympic	77, 78
Optimus	22
Orion	60
Panasonic	16, 17, 77, 78
Pentax	8, 42
Philco	26, 70, 77, 78
Philips	47, 77, 78, 83
Pioneer	78
Quasar	6, 16, 17, 77, 78
RCA/PROSCAN	7, 8, 16, 40, 41, 42, 77, 78, 78*, 83, 101
Realistic	22, 36, 37, 77, 80, 88
Sansui	21
Singer	73
Samsung	24, 24*, 32, 32*, 41, 94, 94*
Sanyo	26, 36, 37, 47
Scott	22, 23, 24, 28, 32, 37, 40, 41
Sharp	88, 89
Shintom	73
Signature 2000	80, 89
Sylvania	77, 78, 80, 83
Symphonic	80
Tashiro	47
Tatung	21, 33, 35
Teac	21, 33, 35, 80
Technics	77, 78
Toshiba	7, 40, 49
Wards	37, 47, 88, 89, 95
Yamaha	21, 33, 35, 36
Zenith	95

* TV/VCR component

Note on the IR SETUP code

Digital program editing is not possible if the VCR does not support IR SETUP codes.

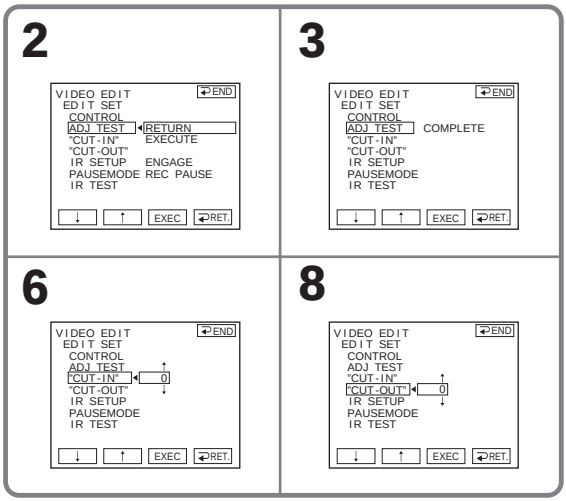
When the VCR does not operate correctly

- After checking the code in "About the IR SETUP code" (p. 80), set the IR SETUP or the PAUSEMODE again.
- Place your camcorder at least 30 cm (12 in.) away from the VCR.
- Refer to the operating instructions of your VCR.

Step 3: Adjusting the synchronization of the VCR

You can adjust the synchronization of your camcorder and the VCR.
Prepare a pen and paper for notes.
Before operation, eject the cassette from your camcorder (if inserted).

(1) Insert the recordable cassette into the VCR, then set the VCR to recording pause.
When you select i.LINK in CONTROL, the recording pause is not necessary.
(2) Select ADJ TEST, then press EXEC.
(3) Select EXECUTE, then press EXEC.
IN and OUT are recorded on an image for five times each to calculate the number values for adjusting the synchronization.
The EXECUTING indicator flashes on the screen. When finished, the indicator changes to COMPLETE.
(4) Rewind the tape in the VCR, then start slow playback.
Five IN numbers and corresponding OUT numbers are displayed.
Take a note of the opening number value of each IN and the closing number value of each OUT.
(5) Calculate the average of five opening number values of five IN, and the average of all the closing number values of each OUT.
(6) Select "CUT-IN," then press EXEC.
(7) Select the average number value of IN, then press EXEC.
The calculated start position for recording is set.
(8) Select "CUT-OUT," then press EXEC.
(9) Select the average number value of OUT, then press EXEC.
The calculated stop position for recording is set.
(10) Press ↩ RET. to execute.



To return to FN

Press ⮌ END to return to PAGE1, then press EXIT.

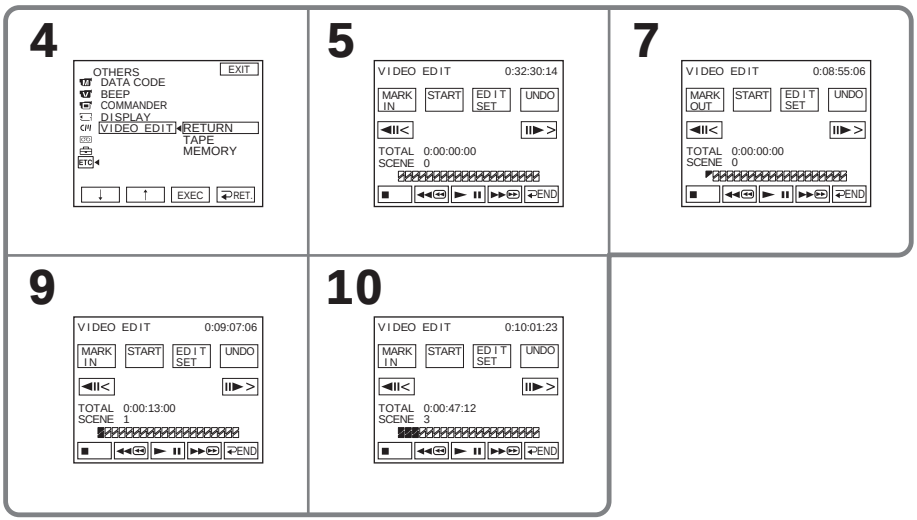
Notes

- When you complete step 3, the image to adjust the synchronization is recorded for about 50 seconds.
- If you start recording from the very beginning of the tape, the first few seconds of the tape may not be recorded properly. Be sure to allow about 10 seconds' lead before starting the recording.
- When the recording unit cannot be operated properly by the i.LINK cable, leave the connection as it is, and make the A/V connecting cable settings (p. 78). Video and audio are sent by digital signals.

Operation 1: Making a Program

The POWER switch should be set to (VCR).
Operate by touching the panel.

(1) Insert the cassette for playback into your camcorder, and insert the tape for recording into the VCR.
(2) Press FN to display PAGE1.
(3) Press MENU to display the menu.
(4) Select VIDEO EDIT in ETC, then press EXEC (p. 177).
(5) Select TAPE, then press EXEC.
(6) Search for the beginning of the first scene you want to insert using the video control buttons on the screen, then pause playback. You can fine-adjust one frame at a time with ◄II< / >II►.
(7) Press MARK IN on the screen.
The IN point of the first program is set, and the upper part of the program mark changes to light blue.
(8) Search for the end of the first scene you want to insert using the video control buttons on the screen, then pause playback. You can fine-adjust one frame at a time with ◄II< / >II►.
(9) Press MARK OUT on the screen.
The OUT point of the first program is set, then the lower part of the program mark changes to light blue.
(10) Repeat step 6 to 9.
When one program is set, the program mark changes to light blue.
You can set 20 programs in maximum.



To finish making programs

Press ⮐ END.
The program is stored in memory until the tape is ejected.

Note
You cannot operate recording during Digital program editing.

On a blank portion of the tape
You cannot set IN or OUT.

If there is a blank portion between the IN point and the OUT point on the tape
The total time may not be displayed correctly.

Erasing the program you have set

Erase OUT mark first, and then IN mark of the last set program.

(1) Press UNDO.
(2) Press ERASE 1 MARK. The last set program mark flashes, then the DELETE ? indicator appears.
(3) Press EXEC. The last set program is deleted.

To cancel erasing
Press CANCEL in step 3.

Erasing all programs

(1) Follow the step 2 to 5 on page 83.
(2) Press UNDO.
(3) Press ERASE ALL. All the set program marks flash, then the DELETE ? indicator appears.
(4) Press EXEC. All the set programs are deleted.

To cancel erasing all programs
Press CANCEL in step 4.

Operation 2: Performing Digital program editing (Dubbing the tape)

(1) When you use a digital video camera recorder, set the power switch of VCR to VCR/VTR.
(2) Make sure your camcorder and the VCR are connected, and that the VCR is set to recording pause.
When you use an i.LINK cable the following procedure is not necessary.
(3) Press FN to display PAGE1.
(4) Press MENU to display the menu.
(5) Select VIDEO EDIT in ETC, then press EXEC (p. 177).
(6) Select TAPE, then press EXEC.
(7) Press START.
(8) Press EXEC.
Search for the beginning of the first program, then start dubbing.
The program mark flashes.
The SEARCH indicator appears during searching, and the EDITING indicator appears during editing on the screen.
The program mark changes to light blue after the dubbing is complete.
When the dubbing ends, your camcorder and the VCR automatically stop.

To cancel dubbing during editing

Press CANCEL.

To end Digital program editing

Your camcorder stops when the dubbing is complete. Then the display returns to VIDEO EDIT in the menu settings.
Press ↩ END to end the video edit function.

You cannot record on the VCR in the following

Indicator	Cause
No indicator	• The write-protect tab on the cassette is set to lock. • The IR SETUP code is not correct. (When IR is selected.) • The button to cancel recording pause is not correct. (When IR is selected.)
CHECK "i.LINK" & REC STATUS	• i.LINK is selected but an i.LINK cable is not connected. • The power of the connected VCR is not turned on. (When i.LINK is selected.)

When the program has not been set

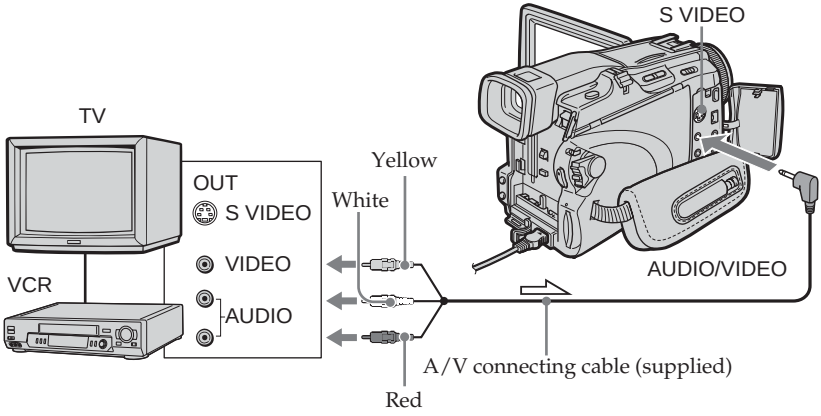
You cannot press START.

Recording video or TV programs

You can record the tape from another VCR or a TV program from a TV that has video/audio outputs. Use your camcorder as a recorder. You can connect either the A/V connecting cable (supplied) or i.LINK cable (optional).
If you connect with the i.LINK cable (optional), video and audio signals are transmitted in digital form for high-quality editing.

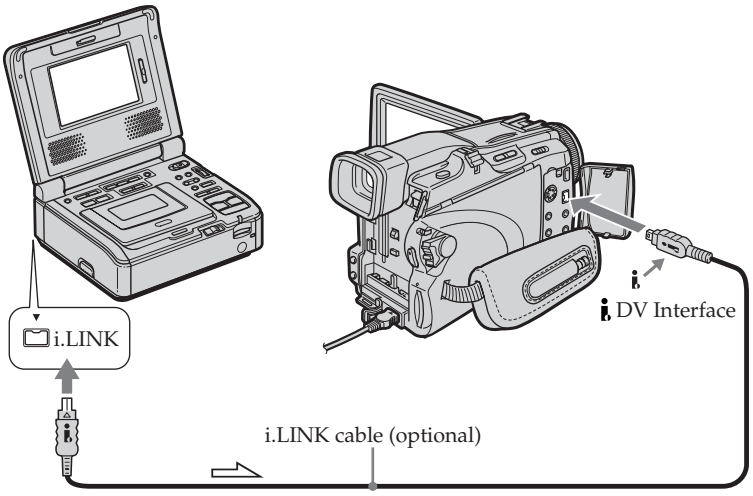
Connecting to the VCR or the TV

Connecting with the A/V connecting cable



: Signal flow

Connecting with the i.LINK cable



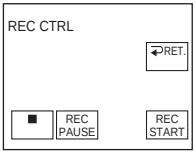
: Signal flow

Recording video or TV programs

Before operation for connecting with the A/V connecting cable
Set DISPLAY in ETC to LCD in the menu settings when using the A/V connecting cable. (The default setting is LCD.)

The POWER switch should be set to VCR.
Operate by touching the panel.

(1) Insert the blank tape (or the tape you want to record over) into your camcorder. If you are recording the tape from the VCR, insert the recorded tape into the VCR.
(2) Press FN and select PAGE3.
(3) Press REC CTRL.



(4) Press REC PAUSE.
(5) Press ► on the VCR to start playback if you record the tape from a VCR. Select a TV program if you record from a TV. The picture from playback side appears on the screen.
(6) Press REC START at the scene where you want to start recording from.

When you have finished dubbing the tape

Press ■ on your camcorder, and then press the stop button on the VCR.

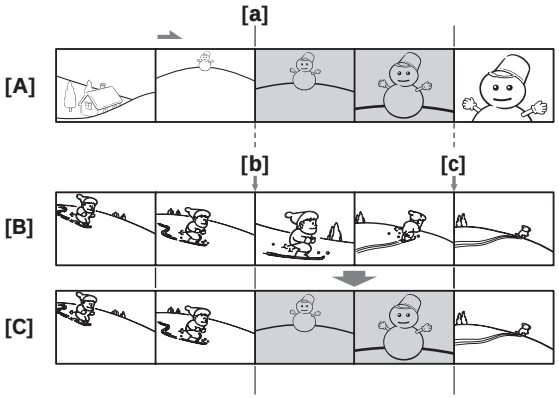
If your VCR is a monaural type
Connect the yellow plug of the A/V connecting cable to the video output jack and the white or the red plug to the audio output jack on the VCR or the TV. When the white plug is connected, the left channel audio is output, and when the red plug is connected, the right channel audio is output.

If your VCR has an S video jack
See page 44 for details.

When using the i.LINK cable
- Before recording, make sure if the DV IN indicator appears on the screen. The DV IN indicator may appear on both equipment.
- Recording of only the picture or sound cannot be done.

Inserting a scene from a VCR – Insert editing

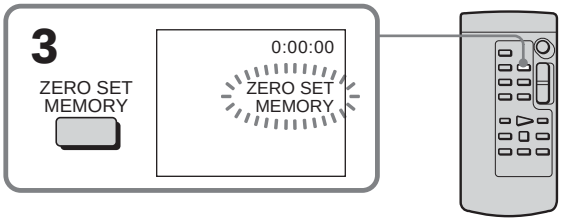
You can insert a new scene with sound from a VCR onto the originally recorded tape by specifying the insert start and end points. Use the Remote Commander for this operation.
Connections are the same as on page 86. Insert a cassette containing the desired scene to insert into the VCR.



[A] The tape that contains the scene to be superimposed
[B] The tape before editing
[C] The tape after editing

The POWER switch should be set to VCR.
Operate by touching the panel.

(1) On the VCR, locate just before the insert start point **[a]**, then set the VCR to playback pause.
(2) On your camcorder, locate the insert end point **[c]**, then set it to playback pause.
(3) Press ZERO SET MEMORY on the Remote Commander. The ZERO SET MEMORY indicator flashes and the end point of the insert is stored in memory. The tape counter shows "0:00:00."
(4) On your camcorder, locate the insert start point **[b]**.
(5) Press FN and select PAGE3.
(6) Press REC CTRL.
(7) Press REC PAUSE.
(8) First press ❚❚ on the VCR, and after a few seconds press REC START on your camcorder to start inserting the new scene with sound.
Inserting automatically stops near the zero point on the tape counter. Your camcorder automatically stops recording. The zero set memory function will be canceled.



To change the insert end point

Press ZERO SET MEMORY on the Remote Commander again after step 4 to erase the ZERO SET MEMORY indicator and begin from step 2.

To insert a scene without setting the insert end point

Skip step 2 and 3. Press ■ on the Remote Commander or ■ on your camcorder when you want to stop inserting.

Audio dubbing

You can record additional audio to the original sound on the tape by connecting audio equipment or a microphone. If you connect the audio equipment, you can add sound to the tape already recorded in the 12-bit mode by specifying starting and ending points. The original sound will not be erased.

Preparing for audio dubbing

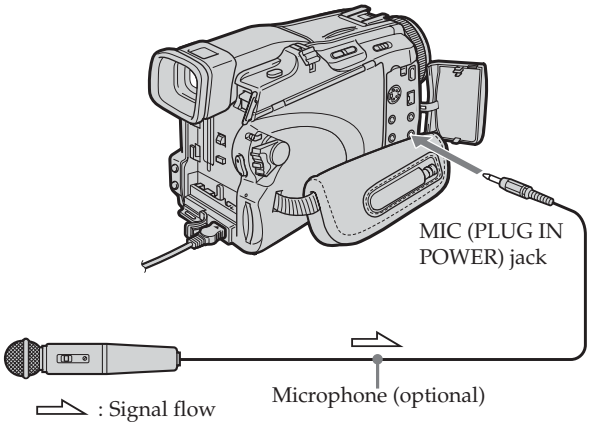
You can record additional audio in the following:
- Dubbing with the built-in microphone
- Connecting the microphone (optional) to the MIC jack
- Connecting the microphone (optional) to the intelligent accessory shoe
- Connecting the A/V connecting cable to the AUDIO/VIDEO jack

The audio input to be recorded will take precedence over others in the following order:
- MIC jack
- Intelligent accessory shoe
- AUDIO/VIDEO jack
- Built-in microphone

Dubbing with the built-in microphone

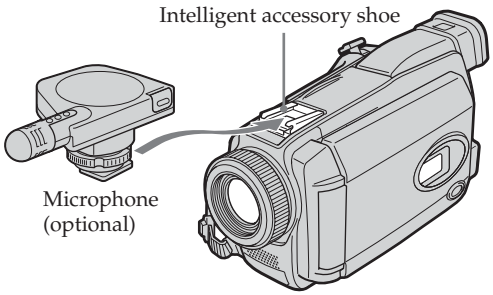
No connection is necessary.
If no external microphone (optional) is connected, sound is recorded via the built-in microphone.

Connecting the microphone (optional) to the MIC jack

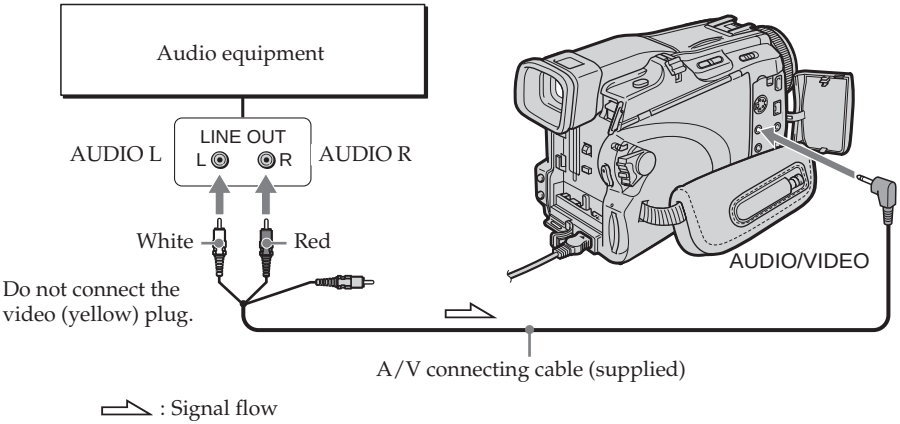


You can check the recorded picture and sound by connecting the AUDIO/VIDEO jack to a TV.
The recorded sound is not output from a speaker. Check the sound by using the headphones or TV.

Connecting the microphone (optional) to the intelligent accessory shoe



Connecting the A/V connecting cable to the AUDIO/VIDEO jack



Note

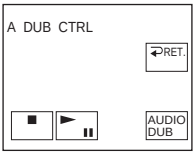
When dubbing with the AUDIO/VIDEO jack or the built-in microphone, pictures are not output through the S VIDEO jack or AUDIO/VIDEO jack. Check the recorded picture on the screen. You can check the recorded sound by using headphones.

Adding an audio sound on the recorded tape

Choose a connection mentioned on page 90, and connect audio equipment or microphone to your camcorder. Then follow the procedure below.

The POWER switch should be set to VCR.
Operate by touching the panel.

(1) Insert the recorded tape into your camcorder.
(2) Locate the recording start point. Press ►II to start playing back. To pause playing back, press ►II at the recording start point. You can fine-adjust the recording start point by pressing ◄II< / >II►.
(3) Press FN and select PAGE3.
(4) Press A DUB CTRL.
The A DUB CTRL screen appears.



(5) Press AUDIO DUB. The green ⊖II indicator appear on the screen.
(6) Press ►II on your camcorder and at the same time start playing back the audio you want to record.
The new sound is recorded in stereo 2 (ST2) during playback. While recording new sound, the red ⊖ indicator appears on the screen.
(7) Press ■ on your camcorder at the point where you want to stop recording.

You cannot audio dubbing in the following cases:
- The tape recorded in the 16-bit mode
- The tape recorded in the LP mode
- Connecting with the i.LINK DV Interface
- The blank portions of the tape
- The cassette set the write-protect tab to lock

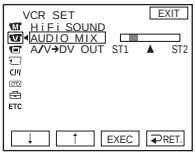
To add new sound more precisely
Press ZERO SET MEMORY at the point where you want to stop recording later during playback.
Follow the step 2. Recording automatically stops at the point where ZERO SET MEMORY was pressed.

We recommend that you add new sound on the tape recorded with your camcorder
If you add new sound on the tape recorded with another camcorder (including other DCR-TRV38/TRV39), the sound quality may become worse.

Monitoring the new recorded sound

The POWER switch should be set to VCR.
Operate by touching the panel.

(1) Play back the tape on which you added audio.
(2) Press FN to display PAGE1.
(3) Press MENU to display the menu.
(4) Select AUDIO MIX in , then press EXEC (p. 170).



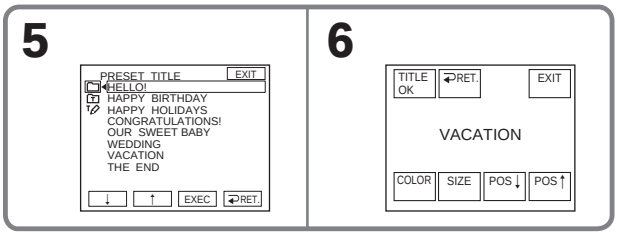
(5) Press ↓/↑ to adjust the balance between the original sound (ST1) and the new sound (ST2), then press EXEC.
About five minutes after you disconnect the power source or remove the battery pack, the setting of AUDIO MIX returns to the original sound (ST1) only. The default setting is original sound only.

Superimposing a title on a cassette with Cassette Memory

One cassette can have up to about 20 titles, if one title consists of five characters. However, if the Cassette Memory is full with date and cassette label data, one cassette can have only up to about 11 titles with five characters each.
Cassette Memory capacity is as follows:
– Six date data (maximum)
– One cassette label (maximum)

The POWER switch should be set to CAMERA or VCR.
Operate by touching the panel.

(1) Insert the cassette with Cassette Memory.
(2) During standby, recording, playback or playback pause, press FN to display PAGE1.
(3) Press MENU to display the menu.
(4) Select TITLE in [C!!], then press EXEC. (p. 173)
(5) Select [🗀], then press EXEC.
(6) Select a desired title, then press EXEC. The title appears on the screen.
(7) If necessary, change the color, size, or position by pressing COLOR, SIZE, POS ↓ or POS ↑.
(8) Press TITLE OK.
(9) Press SAVE TITLE.
During playback, playback pause or recording:
The TITLE SAVE indicator appears on the screen for about five seconds and the title is set.
During recording standby:
The TITLE indicator appears. And when you press START/STOP to start recording, the TITLE SAVE indicator appears on the screen for about five seconds and the title is set.



To use the custom title

If you want to use the custom title, select [T] in step 5.

The titles superimposed with your camcorder

- They appear only by DV Mini DV format video equipment with index titler function.
- The point you superimposed the title may be detected as an index signal when searching a recording with other video equipment.

To not display title

Set TITLE DSPL to OFF in the menu settings (p. 173).

Title setting

- The title color changes as follows:

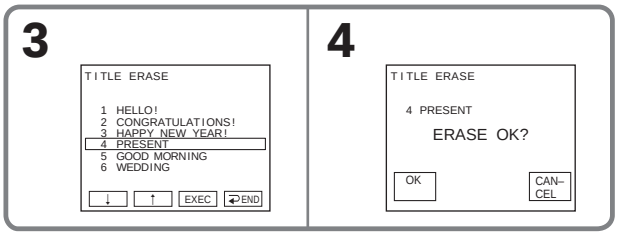
  → WHITE → YELLOW → VIOLET → RED → CYAN → GREEN → BLUE →

- The title size changes as follows:
  SMALL ⟷ LARGE
  You cannot input 13 characters or more in LARGE size.
- The title position as follows:
  If you select the title size SMALL, you have nine choices for the title position.
  If you select the title size LARGE, you have eight choices for the title position.

Erasing a title

The POWER switch should be set to CAMERA or VCR.
Operate by touching the panel.

(1) Press FN to display PAGE1.
(2) Press MENU to display the menu.
(3) Select TITLEERASE in [CAM], then press EXEC (p. 173). The TITLE ERASE screen appears.
(4) Select the title you want to erase, then press EXEC.
The ERASE OK? indicator appears.
(5) Make sure the title is the one you want to erase, then press OK.
The ERASING indicator flashes on the screen.
When the title is erased, the COMPLETE indicator appears.



To return to FN

Press EXIT.

To cancel erasing

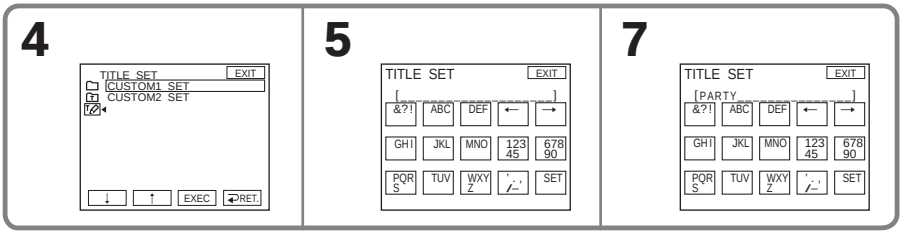
Press CANCEL in step 5.

Making your own titles

You can make up to two titles and store them in the memory of your camcorder. Each title can have up to 20 characters.

The POWER switch should be set to CAMERA or VCR.
Operate by touching the panel.

(1) Press FN to display PAGE1.
(2) Press MENU to display the menu.
(3) Select TITLE in , then press EXEC (p. 173).
(4) Select , then press EXEC.
(5) Select CUSTOM1 SET or CUSTOM2 SET, then press EXEC.
(6) Select a desired character. Repeat pressing a key to select a desired character on the key.
(7) Press → to move the cursor for the next character. Repeat the same procedure as step 6 and 7 to complete your title.
(8) Press SET. The title is stored in memory.



To return to FN

Press EXIT.

To change a title you have stored

In step 5, select CUSTOM1 SET or CUSTOM2 SET, depending on which title you want to change, then press EXEC and enter the new title as desired.

If you take five minutes or longer to enter characters during tape recording standby with the cassette inserted in your camcorder

The power automatically goes off. The characters you have entered remain stored in memory. Set the POWER switch to OFF (CHG) once and then to CAMERA again, then start again from step 1.
We recommend setting the POWER switch to VCR or removing the cassette so that your camcorder does not automatically turn off while you are entering title characters.

To erase the character

Press ←. The last character is erased.

To enter a space

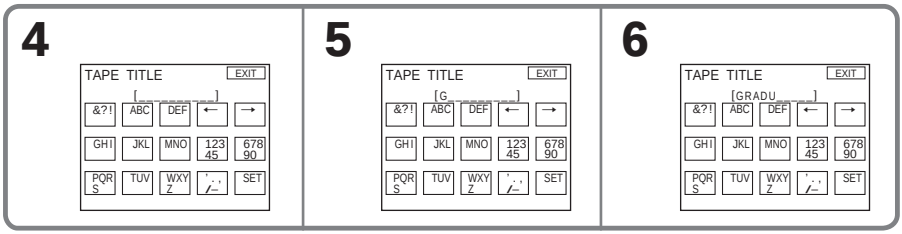
Press →.

Labeling a cassette on a cassette with Cassette Memory

The label can consist of up to 10 characters and are stored in Cassette Memory. When you insert the labeled cassette with the POWER switch set to CAMERA, or the POWER switch is set to VCR, the label is displayed for about five seconds.

The POWER switch should be set to CAMERA or VCR.
Operate by touching the panel.

(1) Insert the cassette with Cassette Memory you want to label.
(2) Press FN to display PAGE1.
(3) Press MENU to display the menu.
(4) Select TAPE TITLE in [CAM], then press EXEC (p. 173). The TAPE TITLE screen appears.
(5) Select a desired character. Repeat pressing a key to select a desired character on the key.
(6) Press → to move the cursor for the next character. Repeat the same procedure as step 5 and 6 to complete the label.
(7) Press SET. The label is stored in memory.



To return to FN
Press EXIT.

To erase the label you have made
Select ← to erase the label in step 5, then press SET.

To change the label you have made
Insert the cassette to change the label, and operate in the same way to make a new label.

If you have superimposed titles in the cassette
When the label appears, up to four titles also appear.

To erase the character
Press ←. The last character is erased.

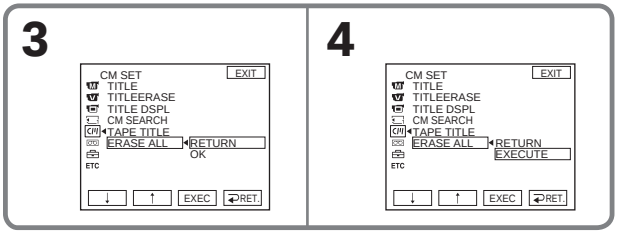
To enter a space
Press →.

Erasing all the data in Cassette Memory

The following data saved in Cassette Memory can be completely erased once:
– Date data
– Title data
– Cassette label

The POWER switch should be set to CAMERA or VCR.
Operate by touching the panel.

(1) Press FN to display PAGE1.
(2) Press MENU to display the menu.
(3) Select ERASE ALL in C/II, then press EXEC (p. 173).
(4) Select OK, then press EXEC.
The OK indicator changes to EXECUTE.
(5) Select EXECUTE, then press EXEC. The ERASING indicator flashes on the screen. Once erasing is complete, the COMPLETE indicator appears.



To return to FN
Press EXIT.

To cancel erasing
Select RETURN in step 5, then press EXEC.

Using "Memory Stick" – Introduction

The "Memory Stick" is a new light and small recording media which, despite of the size, can store greater data than a floppy disk.
The "Memory Stick" can, in addition to recording images and easily playing back images you want to see, follow operations such as:
– Copying images into the "Memory Stick" from the tape
– Capturing images into the computer using the supplied USB cable
– Allow image deletion, protection and writing (with a print mark).

File format

Still image (JPEG)

Your camcorder compresses and records image data in JPEG (Joint Photographic Experts Group) format. The file extension is .jpg.
Exif * Ver.2.2 JPEG compliant, DPOF compatible

* Exif: Exif is a file format for still images, established by the Japan Electronics and Information Technology Industries Association (JEITA). Files in this format can have additional information such as your camcorder's setting information at the time of recording.

Moving picture (MPEG)

Your camcorder compresses and records picture data in MPEG (Moving Picture Expert Group) format. The file extension is .mpg.

Typical image data file name

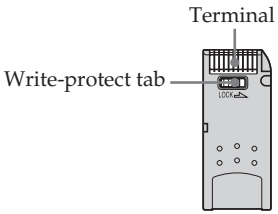
Still image
101-0001: This file name appears on the screen of your camcorder.
DSC00001.JPG: This file name appears on the display of a computer.

Moving picture
MOV00001: This file name appears on the screen of your camcorder.
MOV00001.MPG: This file name appears on the display of a computer.

To prevent from erasing images accidentally

Rear part of the "Memory Stick"

Slide the write-protect tab on the "Memory Stick" to LOCK.
The position and shape of the write-protect tab may be different depending on the model.
Some kinds of "Memory Stick" have no write-protect tab.



Notes on the "Memory Stick"

Labeling position

Stick its label on the labeling position.

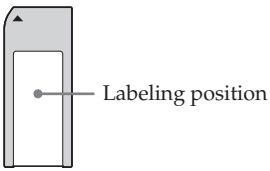


Image data may be damaged in the following cases. Damaging image data is not guaranteed

– If you eject the "Memory Stick" or turn off your camcorder while reading the image file from the "Memory Stick" or recording data onto the "Memory Stick" (while the access lamp is lit or flashing).
– If you use the "Memory Stick" near magnets or magnetic fields such as those of speakers and TV.

We recommend backing up important data on the hard disk of a computer.

On handling

- When you carry or store the "Memory Stick," put it in its case.
- Prevent metallic objects or your finger from coming into contact with the metal parts of the connecting section.
- Do not bend, drop or apply strong shock to the "Memory Stick."
- Do not disassemble or modify the "Memory Stick."
- Do not let the "Memory Stick" get wet.

On location for use

Do not use or keep the "Memory Stick" in locations that are:
– Extremely hot such as in a car parked in the sun or under the scorching sun
– Under direct sunlight
– Very humid or subject to corrosive gases

The "Memory Stick" formatted by a computer

The "Memory Stick" formatted by Windows OS or Macintosh computers does not have a guaranteed compatibility with your camcorder.

Note on the "MagicGate Memory Stick"

You can use the "MagicGate Memory Stick" for recording image data on your camcorder. However, you cannot record or play back the music protected by copyright signals on your camcorder.

Notes on using the "Memory Stick Duo"

- Be sure to insert the "Memory Stick Duo" into the "Memory Stick Duo" Adaptor when using the "Memory Stick Duo" with your camcorder.
- Verify that the insert direction of the "Memory Stick Duo." The use of wrong direction may cause a malfunction.
- Do not insert the "Memory Stick Duo" not inserted into the "Memory Stick Duo" Adaptor into the "Memory Stick"-compatible unit. This may cause a malfunction of the unit.

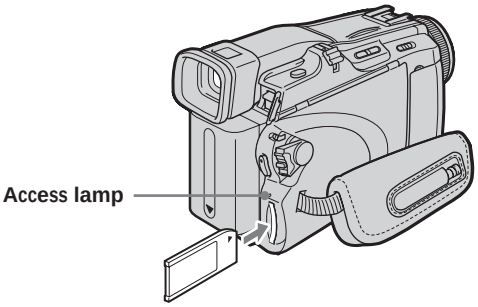
Notes on image data compatibility

- Image data files recorded on the "Memory Stick" by your camcorder conform with the Design Rules for Camera File Systems universal standard established by the JEITA (Japan Electronics and Information Technology Industries Association).
  On your camcorder, you cannot play back still images recorded on other equipment (DCR-TRV890E/TRV900/TRV900E or DSC-D700/D770) that does not conform to this universal standard. (These models are not sold in some areas.)
- If you cannot use the "Memory Stick" that is used with other equipment, format it with your camcorder (p. 172). Note that formatting erases all information on the "Memory Stick."
- Some playback devices may not be able to play back images recorded with your camcorder.
- You may not be able to play back images with your camcorder:
  – When playing back image data modified on a computer
  – When playing back image data shot with other equipment

- The "Memory Stick," MEMORY STICK ™ and "MagicGate Memory Stick" are trademarks of Sony Corporation.
- "Memory Stick Duo" and MEMORY STICK DUO are trademarks of Sony Corporation.
- "MagicGate" and MAGICGATE are trademarks of Sony Corporation.
- All other product names mentioned herein may be the trademarks or registered trademarks of their respective companies.
  Furthermore, "™" and "®" are not mentioned in each case in this manual.

Inserting the "Memory Stick"

Insert the "Memory Stick" in the "Memory Stick" slot as far as it can go with the ▶ mark facing as illustrated.



Ejecting the "Memory Stick"

Press the "Memory Stick" once lightly.

Notes

- If you insert the "Memory Stick" forcibly in the opposite direction, the "Memory Stick" slot may be damaged.
- Do not insert anything other than the "Memory Stick" into the "Memory Stick" slot. This may cause a malfunction.

While the access lamp is lit or flashing

Do not shake or strike your camcorder because your camcorder is reading the data from the "Memory Stick" or recording the data on the "Memory Stick." Do not turn the power off, eject the "Memory Stick" or remove the battery pack. Otherwise, image data breakdown may occur.

If "MEMORY STICK ERROR" appears

Reinsert the "Memory Stick" a few times. The "Memory Stick" may be damaged if the indicator still appears. If this occurs, use another "Memory Stick."

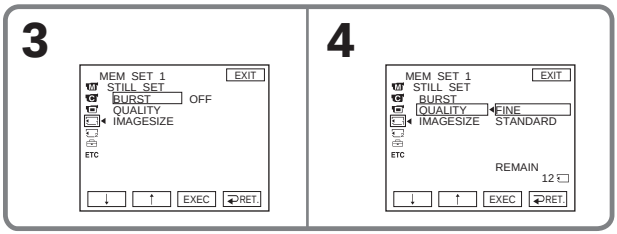
Selecting the quality and size of image data

Selecting still image quality

The default setting is FINE.

The POWER switch should be set to (MEMORY) or (VCR).
Operate by touching the panel.

(1) Press FN to display PAGE1.
(2) Press MENU to display the menu.
(3) Select STILL SET in , then press EXEC (p. 171).
(4) Select QUALITY, then press EXEC.
(5) Select a desired image quality, then press EXEC.



Setting	Meaning
FINE (FINE)	Use this mode when you want to record high quality images. Fine images are compressed to about 1/4.
STANDARD (STD)	This is the standard image quality. Standard images compressed to about 1/10.

To return to FN

Press EXIT.

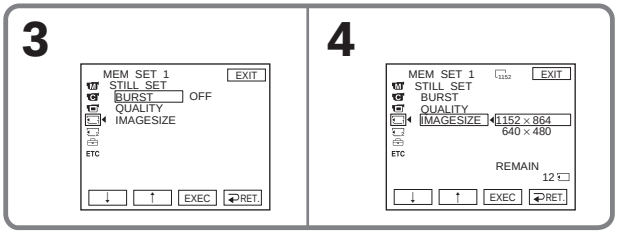
Selecting the still image size

You can select image size 1152 × 864 or 640 × 480 (When the POWER switch is set to CAMERA or VCR, the image size is automatically set to 640 × 480.).
The default setting is 1152 × 864.

The POWER switch should be set to (MEMORY).
Operate by touching the panel.

(1) Press FN to display PAGE1.
(2) Press MENU to display the menu.
(3) Select STILL SET in , then press EXEC (p. 171).
(4) Select IMAGESIZE, then press EXEC.
(5) Select a desired image size, then press EXEC.
The indicator changes as follow:

1152 ↔ 640



Memory capacity of still images

Recorded images are compressed in JPEG format before being stored in memory. The memory capacity of still images varies depending on the selected image quality mode and image size. Details are shown in the table below.

1152 × 864 image size

Image quality	Memory capacity
FINE	About 500 KB
STANDARD	About 200 KB

640 × 480 image size

Image quality	Memory capacity
FINE	About 150 KB
STANDARD	About 60 KB

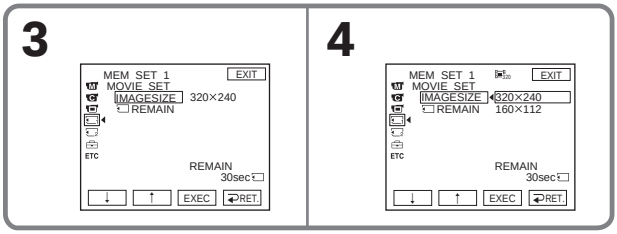
Selecting the moving picture size

You can select picture size 320 × 240 or 160 × 112.
The default setting is 320 × 240.

The POWER switch should be set to (MEMORY) or (VCR).
Operate by touching the panel.

(1) Press FN to display PAGE1.
(2) Press MENU to display the menu.
(3) Select MOVIE SET in [camera], then press EXEC (p. 171).
(4) Select IMAGESIZE, then press EXEC.
(5) Select a desired image size, then press EXEC.
The indicator changes as follow:

320 ⟷ 160



Approximate number of still images and time of moving pictures that can be recorded on one "Memory Stick"

The number of still images and the time of moving pictures you can record vary depending on which image quality mode you select and the complexity of the subject.

Still images

(Unit: Image)

Type of "Memory Stick"	FINE		STANDARD	
	1152 × 864	640 × 480	1152 × 864	640 × 480
8MB (supplied)	15	50	37	120
16MB (optional)	30	96	74	240
32MB (optional)	61	190	150	485
64MB (optional)	120	390	300	980
128MB (optional)	245	780	600	1970

Moving pictures

Type of "Memory Stick"	Image size	
	320 × 240	160 × 112
8MB (supplied)	1 min. 20 sec.	5 min. 20 sec.
16MB (optional)	2 min. 40 sec.	10 min. 40 sec.
32MB (optional)	5 min. 20 sec.	21 min. 20 sec.
64MB (optional)	10 min. 40 sec.	42 min. 40 sec.
128MB (optional)	21 min. 20 sec.	1 hr 25 min. 20 sec.

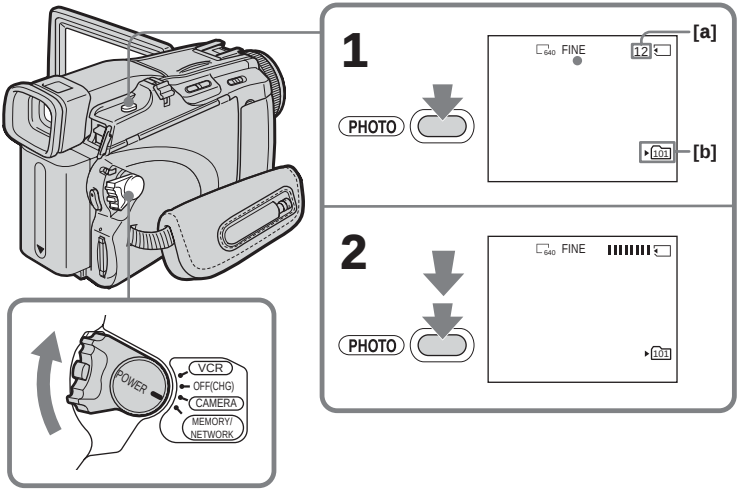
The table shows approximate number of still images and time of moving pictures that can be recorded on the "Memory Stick" formatted with your camcorder.

Recording still images on “Memory Stick” – Memory Photo recording

The POWER switch should be set to MEMORY.

(1) Keep pressing PHOTO lightly and check the image. The green ● indicator stops flashing, then lights up. The brightness of the image and the focus are adjusted and fixed while your camcorder targets at the middle of the image. Recording does not start yet.

(2) Press PHOTO deeply.
Recording is complete when the bar scroll indicator disappears.
The image displayed on the screen when you pressed PHOTO deeply will be recorded on the “Memory Stick.”



[a] Approximate number of images can be recorded on the “Memory Stick”
[b] Folder name to be recorded

You can record still images on the "Memory Stick" during tape recording or tape recording standby
See page 45 for details.

When the POWER switch is set to MEMORY
The following functions do not work:
– Digital zoom
– Super NightShot
– Color Slow Shutter
– Wide mode
– Fader
– Picture effect
– Digital effect
– SPORTS of PROGRAM AE (The indicator flashes.)
– Title
– SteadyShot

During saving a still image data
You cannot turn off the power or press PHOTO.

When you press PHOTO on the Remote Commander
Your camcorder immediately records the image that is on the screen when you press the button.

When you press PHOTO lightly in step 1
The image momentarily flickers. This is not a malfunction.

Recording data
The recording data (date/time or various settings when recorded) do not appear during recording. However, they are recorded automatically onto the "Memory Stick." To display the recording data, press DATA CODE during playback. You can also use the Remote Commander for this operation (p. 39).

If you record still images when the POWER switch is set to MEMORY
The angle of view is slightly larger compared with the angle of view when the POWER switch is set to CAMERA.

Recording images continuously

You can record still images continuously. Before recording, select a desired mode described below in the menu settings.

NORMAL [a] ( )
Your camcorder shoots up to four still images in 1152 × 864 size or 13 still images in 640 × 480 size at about 0.5 sec intervals.

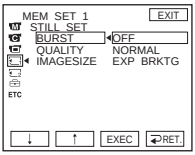
EXP BRKTG [b] (BRK)
Your camcorder automatically shoots three images at about 0.5 sec intervals at different exposures.

[a]

[b]

The POWER switch should be set to (MEMORY).
Operate by touching the panel.

(1) Press FN to display PAGE1.
(2) Press MENU to display the menu.
(3) Select STILL SET in , then press EXEC (p. 171).
(4) Select BURST, then press EXEC.



(5) Select a desired mode, then press EXEC.
(6) Press EXIT to make the menu display disappear.
(7) Press PHOTO deeply.

The number of still images in continuous shooting
The number of still images you can shoot continuously varies depending on the image size and the capacity of the “Memory Stick.”

During continuous recording of images
The flash (optional) does not work.

When shooting with the self-timer or the Remote Commander
Your camcorder automatically records up to the maximum number of still images.

If remaining capacity on the “Memory Stick” is less than for three images
EXP BRKTG does not work. “ FULL” appears when you press PHOTO.

The effect of EXP BRKTG
The effect of EXP BRKTG may not be noticeable on the screen.
We recommend viewing images on TV or the computer to recognize the effect.

When selecting NORMAL
Recording continues up to the maximum number of still images during pressing PHOTO deeply.

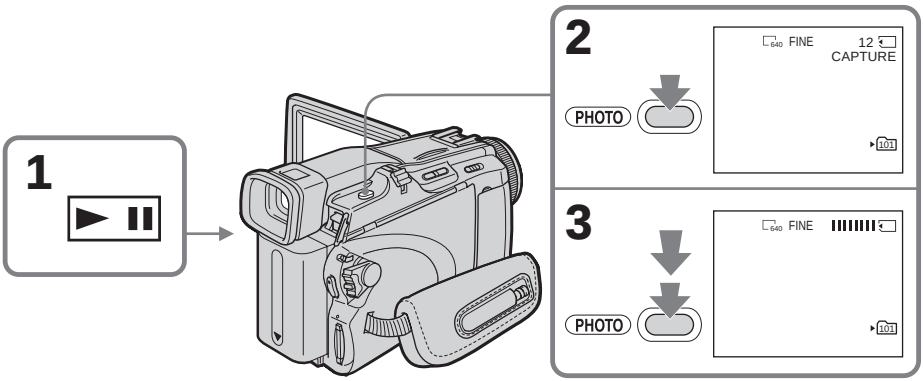
Recording an image from tape as a still image

Your camcorder can read moving picture data recorded on a tape and record it as a still image on the "Memory Stick."
Image size is automatically set to 640 × 480.

Before operation
Insert the "Memory Stick" and the recorded tape into your camcorder.

The POWER switch should be set to VCR.
Operate by touching the panel.

(1) Press ▶II. The picture recorded on the tape is played back.
(2) Keep pressing PHOTO lightly and check the image. The picture from the tape freezes and the CAPTURE indicator appears on the screen. Recording does not start yet.
To change the still image, release PHOTO, select a still image again, and then press and hold PHOTO lightly.
(3) Press PHOTO deeply. Recording is complete when the bar scroll indicator disappears. The image displayed on the screen when you pressed PHOTO deeply will be recorded on the "Memory Stick."



Sound recorded on the tape
You cannot record audio from the tape.

Title
You cannot record the titles.

Recording date/time
The date/time when it is recorded on the "Memory Stick" is recorded. Various settings are not recorded.

When you press PHOTO on the Remote Commander
Your camcorder immediately records the image that is on the screen when you press the button.

Recording a still image from other equipment

You can use either A/V connecting cable or i.LINK cable. Connect the devices as illustrated on page 86.
When connecting with the A/V connecting cable, set DISPLAY in ETC to LCD in the menu settings. (The default setting is LCD.)

The POWER switch should be set to VCR.

(1) Play back the recorded tape, or turn the TV on to see a desired program. The image of the other equipment is displayed on the LCD screen or in the viewfinder.
(2) At the point where you want to record, follow the step 2 and 3 on page 110.

Note

If recording from a tape in poor condition, such as one that has been reused often for recording, you may be unable to record still images, or the still images you do record may be distorted.

Superimposing a still image in “Memory Stick” on an image – MEMORY MIX

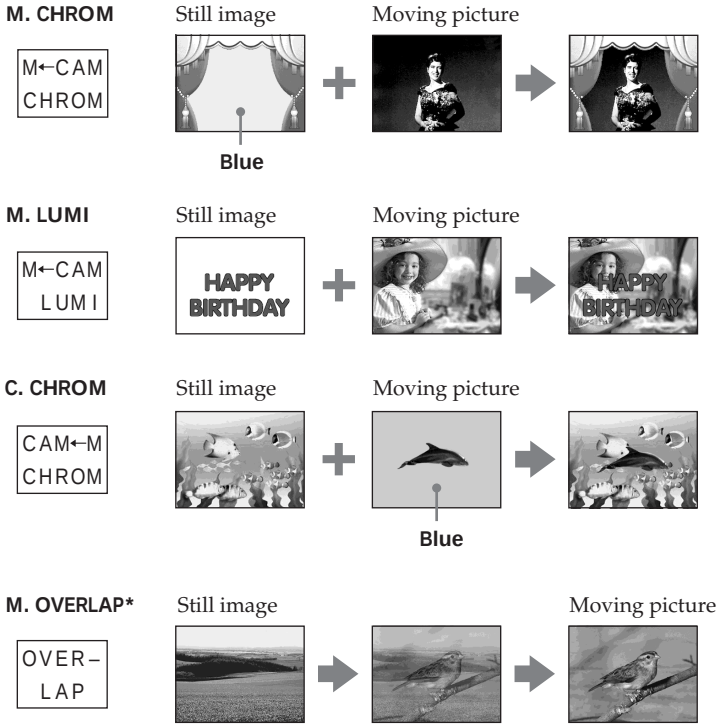
You can superimpose a still image you have recorded on the “Memory Stick” on top of the moving picture you are recording. (However you cannot superimpose a still image onto the moving picture you have finished recording.) You can record the superimposed images on the tape or the “Memory Stick.” (However, you can record only superimposed still images on the “Memory Stick.”)

M. CHROM (Memory Chroma key)
You can swap only the blue area of a still image such as an illustration or a frame with a moving picture.

M. LUMI (Memory Luminance key)
You can swap the brighter area of a still image (such as a handwritten illustration or a title) with a moving picture. To use this function, we recommend recording a title on the “Memory Stick” before a trip or event.

C. CHROM (Camera Chroma key)
You can superimpose a moving picture on top of a still image such as an image which can be used as background. Shoot the subject against a blue background. Only the blue area of the moving picture will be swapped with a still image.

M. OVERLAP (Memory Overlap)*
You can make a moving picture recording with your camcorder fade in on top of a still image recorded on the “Memory Stick.”



* You can select M. OVERLAP when the POWER switch is set to CAMERA.

The "Memory Stick" supplied with your camcorder stores 20 images:
– For M. CHROM: 18 images (such as a frame) 101-0001 to 101-0018
– For C. CHROM: two images (such as a background) 101-0019 to 101-0020

Sample images
Sample images stored in the "Memory Stick" supplied with your camcorder are protected (p. 131).

Notes
- You cannot use MEMORY MIX for moving pictures recorded on the "Memory Stick."
- When the overlapping still image has a large amount of white, the thumbnail image of the picture may not be clear.
- In the mirror mode (p. 30), the picture on the LCD screen is not a mirror-image.

Image data modified on a computer
You may not be able to play modified images back with your camcorder.

Recording a superimposed image to the tape

Before operation
- Insert the "Memory Stick" recorded with still images into your camcorder.
- Insert the tape for recording into your camcorder.

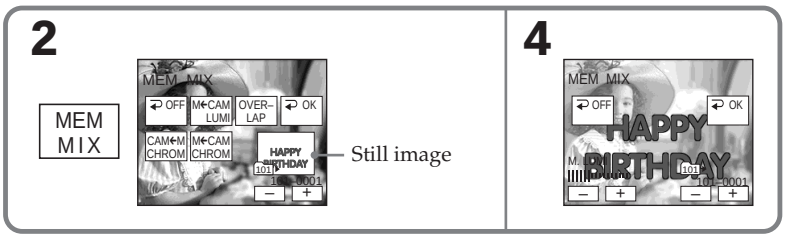
The POWER switch should be set to CAMERA.
Operate by touching the panel.

(1) Press FN and select PAGE2.
(2) Press MEM MIX. The image recorded on the "Memory Stick" appears in the lower right corner of the screen.
(3) Press – (to see the previous image)/+ (to see the next image) in the lower right corner of the screen to select the still image that you want to superimpose.
(4) Press a desired mode. The still image is superimposed on the moving picture during recording standby.
(5) Press –/+ in the lower left corner of the screen to adjust the effect, then press ↩ OK to return to PAGE2.

M. CHROM	– The color (blue) scheme of the area in the still image which is to be swapped with a moving picture
M. LUMI	– The color (bright) scheme of the area in the still image which is to be swapped with a moving picture
C. CHROM	– The color (blue) scheme of the area in the moving picture which is to be swapped with a still image
M. OVERLAP*	– No adjustment necessary

* You can select M. OVERLAP when the POWER switch is set to CAMERA.

(6) Press EXIT to return to FN.
(7) Press START/STOP to start recording.



To change the still image to be superimposed

Press –/+ in the lower right corner before step 5.

To cancel MEMORY MIX

Press ↩ OFF to return to PAGE2.

Note

During recording you cannot reselect the mode. Press ↩ OFF to return to PAGE2.

When you select M. OVERLAP

You cannot change the still image or the mode.

During recording

You cannot change the mode.

Recording a superimposed image to the “Memory Stick” as a still image

Before operation

Insert the “Memory Stick” recorded with still images into your camcorder.

The POWER switch should be set to (MEMORY).
Operate by touching the panel.

(1) Follow the step 1 to 6 on page 113.
(2) Press PHOTO deeply to start recording.
Recording is complete when the bar scroll indicator disappears. The image displayed on the screen when you pressed PHOTO deeply will be recorded on the “Memory Stick.”

To cancel MEMORY MIX

Press ↩ OFF to return to PAGE2.

Image size of still images

Image size is automatically set to 640 × 480.

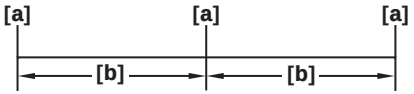
To record still images as-is to the tape

Press –/+ in the lower left corner of the screen in M. LUMI mode and keep going until the bar display on the right is full.

Interval Photo Recording

You can carry out a time-lapse recording by setting the camcorder to automatically record still images.

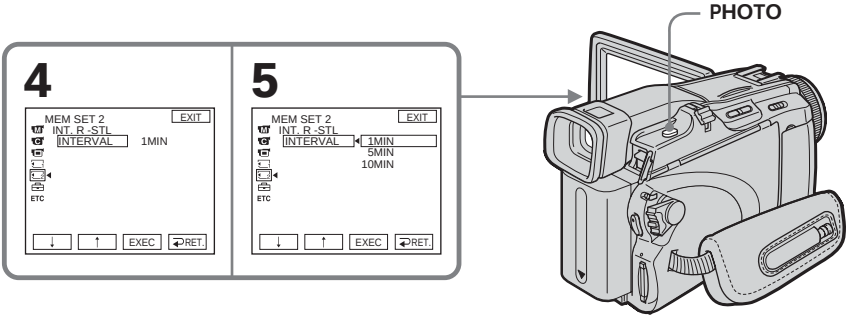
Example



[a] Memory Photo recording
[b] INTERVAL 10 min

The POWER switch should be set to (MEMORY).
Operate by touching the panel.

(1) Press FN to display PAGE1.
(2) Press MENU to display the menu.
(3) Select INT. R -STL in , then press EXEC (p. 172).
(4) Select SET, then press EXEC.
(5) Select INTERVAL, then press EXEC.
(6) Select a desired interval time, then press EXEC.
(7) Press ↩ RET.
(8) Set INT. R -STL to ON, then press EXEC.
(9) Press EXIT to return to FN.
The INTERVAL MEM STILL indicator flashes on the screen.
(10) Press PHOTO deeply.
Interval Photo Recording starts.
The INTERVAL MEM STILL indicator lights up on the screen during Interval Photo Recording.



To cancel Interval Photo Recording

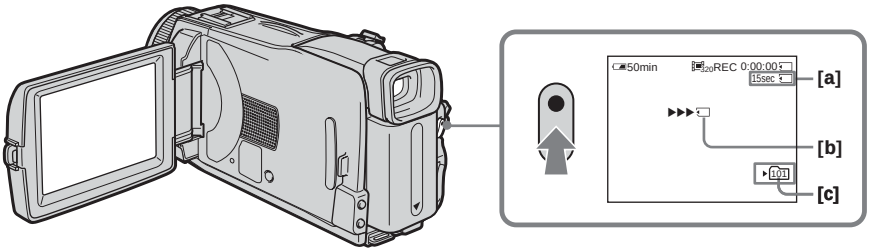
Set INT. R -STL to OFF in the menu settings.

Recording moving pictures on “Memory Stick” – MPEG MOVIE recording

The picture and sound are recorded up to the full capacity of the “Memory Stick” (MPEG MOVIE EX).

The POWER switch should be set to MEMORY.

Press START/STOP.
Your camcorder starts recording. The camera recording lamp located on the front of your camcorder lights up.
The picture and sound are recorded up to the capacity of the “Memory Stick.” See page 105 for details of recording time.



[a] Available recording time on the “Memory Stick”
[b] This indicator appears for five seconds after pressing START/STOP. This indicator is not recorded.
[c] Folder name to be recorded

To stop recording

Press START/STOP.

Note

Sound is recorded in monaural.

When the POWER switch is set to MEMORY

The following functions do not work:
– Digital zoom
– Super NightShot
– Color Slow Shutter
– Wide mode
– Fader
– Picture effect
– Digital effect
– SPORTS of PROGRAM AE (The indicator flashes.)
– Title
– SteadyShot

When using an external flash (optional)

Turn the power of the external flash off when recording moving pictures on the “Memory Stick.” Otherwise, the charging sound of the flash may be recorded.

Recording date/time

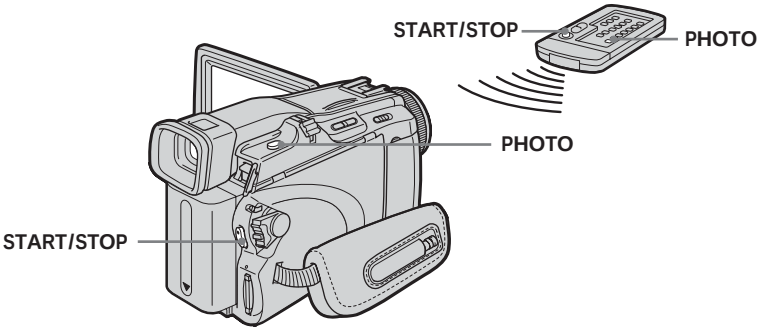
The date/time do not appear during recording. However, they are automatically recorded onto the “Memory Stick.” To display the recording date/time, press DATA CODE during playback. Various settings cannot be recorded (p. 39).

Self-timer recording

You can record moving pictures on the “Memory Stick” with the self-timer. See page 118 for details.

Self-timer recording

You can record still images and moving pictures on the "Memory Stick" with the self-timer. You can also use the Remote Commander for this operation.



Recording a still image

The POWER switch should be set to (MEMORY).
Operate by touching the panel.

(1) Press FN and select PAGE2.
(2) Press SELFTIMER.
The (self-timer) indicator appears on the screen.
(3) Press EXIT to return to FN.
(4) Press PHOTO deeply.
The self-timer starts counting down from about 10 with a beep. In the last two seconds of the countdown, the beep gets faster, then recording starts automatically.

Recording a moving picture

The POWER switch should be set to (MEMORY).
Operate by touching the panel.

(1) Follow the step 1 to 3 in "Recording a still image."
(2) Press START/STOP.
The self-timer starts counting down from about 10 with a beep. In the last two seconds of the countdown, the beep gets faster, then recording starts automatically.

To stop the countdown for recording moving picture

Press START/STOP. To restart the countdown, press START/STOP again.

To cancel the self-timer

With your camcorder during standby, press SELFTIMER and the (self-timer) indicator disappears from the screen. You cannot cancel the self-timer using the Remote Commander.

Note

The self-timer recording is automatically canceled when self-timer recording is finished.

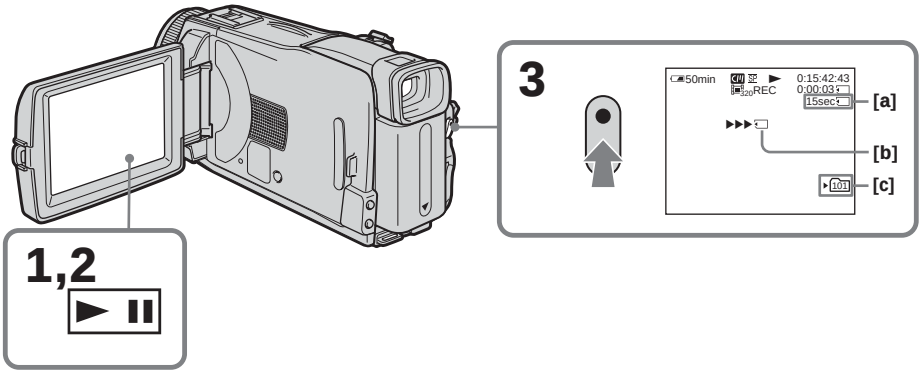
Recording a picture from tape as a moving picture

Your camcorder can read moving picture data recorded on a tape and record it as a moving picture on the "Memory Stick."

Before operation
Insert the recorded tape into your camcorder.

The POWER switch should be set to (VCR).
Operate by touching the panel.

(1) Press ▶II. The picture recorded on the tape is played back.
(2) Press ▶II again to pause playback at the scene where you want to start recording from.
(3) Press START/STOP. Images and sound are recorded up to the remaining capacity of the "Memory Stick." See page 105 for details of recording time.



[a] Available recording time on the "Memory Stick"
[b] This indicator appears for five seconds after pressing START/STOP. This indicator is not recorded.
[c] Folder name to be recorded

To stop recording

Press START/STOP.

Notes

- Sound recorded in 48 kHz is converted to one in 32 kHz when recording images from the tape to the "Memory Stick."
- Sound recorded in stereo is converted to monaural sound when recording from the tape.

Titles
You cannot record the titles.

If the "AUDIO ERROR" indicator appears
Sound that cannot be recorded by your camcorder has been recorded. Connect the A/V connecting cable to input images played back on an external device (p. 120).

Recording date/time
The date/time when it is recorded on the "Memory Stick" are recorded. Various settings are not recorded.

Recording a moving picture from other equipment

You can use either A/V connecting cable or i.LINK cable. Connect the devices as illustrated on page 86.
When connecting with the A/V connecting cable, set DISPLAY in ETC to LCD in the menu settings. (The default setting is LCD.)

The POWER switch should be set to (VCR).

(1) Play back the recorded tape on the VCR, or turn the TV on to see a desired program.
The image of the other equipment is displayed on the LCD screen or in the viewfinder.
(2) Press START/STOP at the scene where you want to start recording from.

Note

In the following instances, recording may stop in the middle, or distorted images may be recorded:
– If the tape has a blank portion
– If recording from a tape in a poor condition, such as one that has been reused often for recording
– If the input signal is cut off

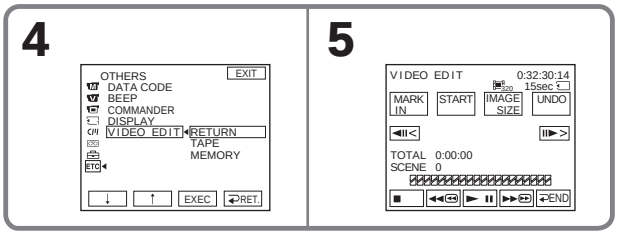
Recording edited pictures from tape as a moving picture – Digital program editing (on "Memory Stick")

You can duplicate selected scenes (programs) for editing onto the "Memory Stick."

Making the program

The POWER switch should be set to (VCR).
Operate by touching the panel.

(1) Insert the tape for playback, and the "Memory Stick" for recording into your camcorder.
(2) Press FN to display PAGE1.
(3) Press MENU to display the menu.
(4) Select VIDEO EDIT in ETC, then press EXEC (p. 177).
(5) Select MEMORY, then press EXEC.
(6) Repeat pressing IMAGESIZE to select a desired size. The image size changes when you press IMAGESIZE.
(7) Follow the step 6 to 10 on page 83.



To finish making programs

Press ↩ END.
The program is stored in memory until the tape is ejected.

Notes

- You cannot dub the titles, display indicators, or the contents of Cassette Memory.
- You cannot operate recording during the Digital program editing on the "Memory Stick."

On a blank portion of the tape

You cannot set IN or OUT on a blank portion of the tape.

If there is a blank portion between IN and OUT on the tape

The total time may not appear correctly.

During making a program

If you eject the cassette, the NOT READY indicator appears on the screen. The program will be erased.

Erasing the program you have set

See "Erasing the program you have set" on page 84.

Erasing all programs

(1) Press FN to display PAGE1.
(2) Press MENU to display the menu.
(3) Select VIDEO EDIT in ETC, then press EXEC (p. 177).
(4) Select MEMORY, then press EXEC.
(5) Follow the step 2 to 4 on page 84.

Performing the program (Dubbing the "Memory Stick")

The POWER switch should be set to VCR.
Operate by touching the panel.

(1) Press FN to display PAGE1.
(2) Press MENU to display the menu.
(3) Select VIDEO EDIT in ETC, then press EXEC (p. 177).
(4) Select MEMORY, then press EXEC.
(5) Press START.
(6) Press EXEC.
Your camcorder searches for the beginning of the first program, then starts dubbing.
The program mark flashes.
The SEARCH indicator appears during searching, the EDITING indicator appears during writing of data on your camcorder, and the REC indicator appears during dubbing on the screen.
The program mark changes to light blue after dubbing is complete.
When the dubbing ends, your camcorder automatically stops.

To stop dubbing

Press CANCEL.
The program you made is recorded on the "Memory Stick" up to the place where you pressed CANCEL.

To end Digital program editing

Your camcorder stops when the dubbing ends. Then the display returns to VIDEO EDIT in the menu settings.
Press ⮐ END to end Digital program editing.

Note

In the following instances, recording may stop in middle, or distorted images may be recorded:
– If the tape has a blank portion
– If recording from a tape in a poor condition, such as one that has been reused often for recording

The NOT READY indicator appears on the screen when:

– The program to operate Digital program editing has not been made.
– The "Memory Stick" is not inserted.
– The write-protect tab on the "Memory Stick" is set to LOCK.

When the available recording time of the "Memory Stick" is not enough

The LOW MEMORY indicator appears on the screen. However, you can record pictures up to the time indicated.

When the program has not been set

You cannot press START.

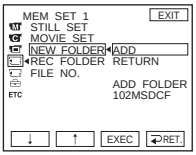
Changing the recording folder

You can create folders up to "999MSDCF" in the "Memory Stick."
The default setting is "101MSDCF" folder to record.

Creating a new folder

The POWER switch should be set to (MEMORY).
Operate by touching the panel.

(1) Press FN to display PAGE1.
(2) Press MENU to display the menu.
(3) Select NEW FOLDER in , then press EXEC (p. 171).



(4) Select ADD, then press EXEC. A folder with the maximum number+1 will be created. A created folder is automatically set to the folder to record.

To return to FN

Press EXIT.

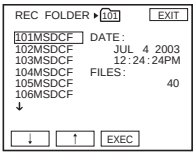
To cancel creating a new folder

Select RETURN, then press EXEC in step 4.

Choosing the recording folder

The POWER switch should be set to (MEMORY).
Operate by touching the panel.

(1) Press FN to display PAGE1.
(2) Press MENU to display the menu.
(3) Select REC FOLDER in , then press EXEC (p. 171).



(4) Press ↓/↑ to select a folder you want to save to, then press EXEC.

To return to FN

Press EXIT.

Notes

- Up to 9999 image files can be recorded in each folder. When a folder is full, a new folder is automatically created.
- Once a folder is created, it cannot be deleted with your camcorder.
- The more folders you have created, the less the remaining capacity of the "Memory Stick" becomes.

Viewing a still image – Memory Photo playback

You can play back still images recorded on the "Memory Stick."
You can also play back six images including moving pictures at a time arranged in the same order of recording on the "Memory Stick" by selecting the index screen.

The POWER switch should be set to (MEMORY).
Operate by touching the panel.

(1) Press PLAY. The last recorded image is displayed.
(2) Press – (to see the previous image)/+ (to see the next image) on your camcorder to select a desired still image.

To cancel Memory Photo playback

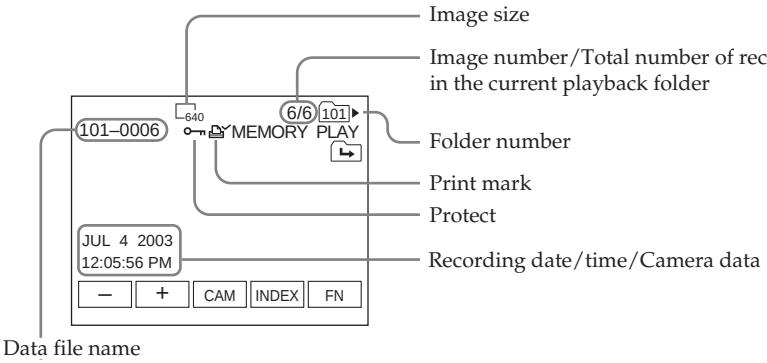
Press CAM.

When no file is in the folder

The "NO FILE AVAILABLE" indicator appears.

Screen indicators during still image playback

To make screen indicators disappear, press DISPLAY/BATTERY INFO.



Recording data

To display the recording data (date/time or various settings when recorded), press DATA CODE during playback. You can also use the Remote Commander for this operation (p. 39).

Notes on the file name

- The folder may not appear and only the file name may appear if the structure of the folder does not conform to the DCF standard.
- The file name flashes on the screen if the file is corrupted or the file is unreadable.

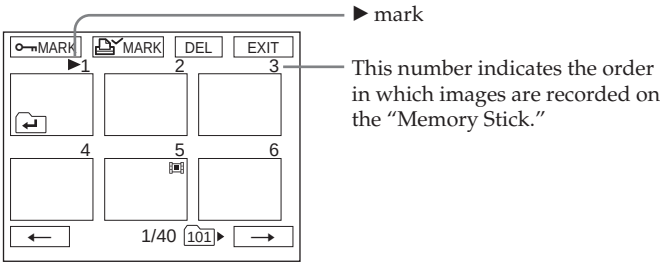
When the "Memory Stick" contains multiple folders

The following icons appear on the screen on the first or last images in a folder.
: You can move to the previous folder.
: You can move to the next folder.
: You can move to both the previous and the next folders.

Playing back six recorded images at a time (index screen)

This function is especially useful when searching for a particular image.

Press INDEX to display the index screen.
A red ▶ mark appears above the image that appears before changing to the index screen mode.
←: To display the previous six images
→: To display the next six images



To return to FN

Press EXIT.

To return to the normal playback screen (single screen)

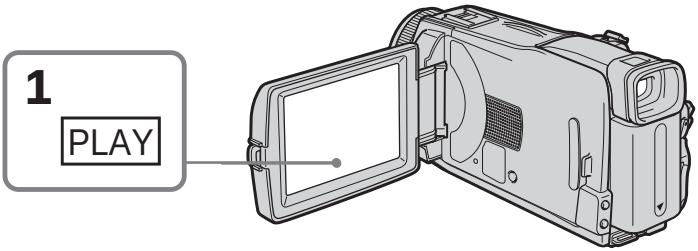
Press the image you want to display.

Viewing a moving picture – MPEG MOVIE playback

You can play back moving pictures recorded on the "Memory Stick."
You can also play back six images including still images in order of recording on the "Memory Stick" at a time by selecting the index screen.

The POWER switch should be set to (MEMORY).
Operate by touching the panel.

(1) Press PLAY. The last recorded image appears.
(2) Press – (to see the previous picture)/+ (to see the next picture) to select a desired moving pictures.
(3) Press MPEG ► II to start playback.
(4) Adjust the volume following the steps below.
  ① Press FN and select PAGE3.
  ② Press VOL. The screen to adjust volume appears.
  ③ Press – (to turn down the volume)/+ (to turn up the volume) to adjust the volume.
  ④ Press ↩ OK to return to PAGE3.
  ⑤ Press EXIT to return to FN.



To cancel MPEG MOVIE playback

Press MPEG ► II.

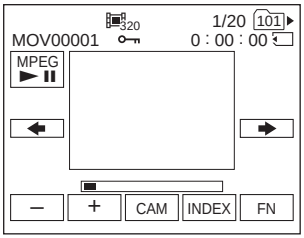
When no file is in the folder
The "NO FILE AVAILABLE" indicator appears.

Playback picture from desired part

The moving picture recorded on the "Memory Stick" is divided into parts. It is divided into a maximum of 60.
You can select every each one point and playback pictures.

The POWER switch should be set to (MEMORY).
Operate by touching the panel.

(1) Follow the step 1 and 2 on page 126.
(2) Press ⬅ (to see previous part)/➡ (to see next part) to select the point where you want to play back.



(3) Follow the step 3 and 4 on page 126.

To cancel MPEG MOVIE playback

Press MPEG ► II.

When recording time is too short
The moving picture may not be divided into parts.

Screen indicators during moving picture playback

To make screen indicators appear or disappear, press DISPLAY/BATTERY INFO.

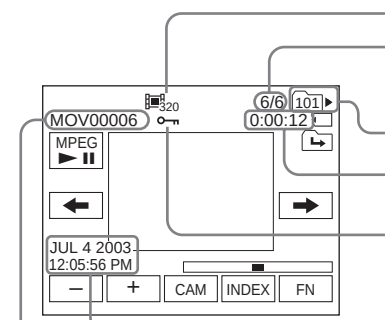


Image size
Picture number/Total number of recorded pictures in the current playback folder
Folder number
Memory playback time
Protect
Recording date/time (Camera data appear as "– – –.")
Data file name

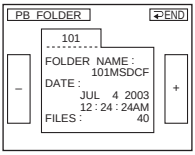
Recording date/time
To display the recording date/time, press DATA CODE during playback. You can also use the Remote Commander for this operation (p. 39).

Choosing playback folder

You can change the folder currently chosen for playback. The currently chosen folder is displayed in the upper right on the screen.

The POWER switch should be set to (MEMORY).
Operate by touching the panel.

(1) Press FN to display to PAGE1.
(2) Press PB FOLDR.
(3) Press –/+ to select the folder number you want to play back, then press ↩ END to return to PAGE1.



– : To select the previous folder
+ : To select the next folder

(4) Press EXIT to play back the image.

Note

Your camcorder does not recognize folder names created or changed using the computer.

Current playback folder

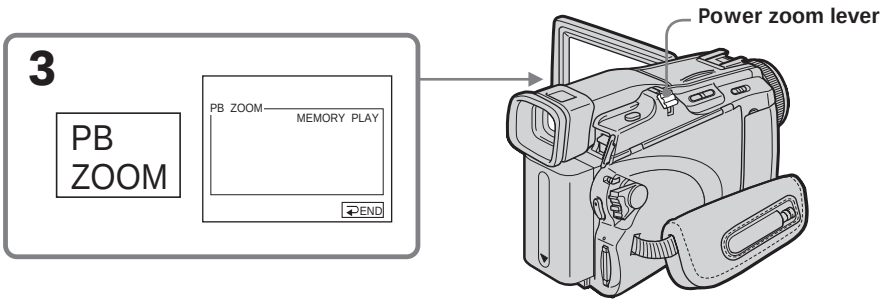
The current playback folder is valid until the next recording is made. Once you record an image, the current folder to record becomes the current playback folder.

Enlarging still images recorded on “Memory Stick” – Memory PB ZOOM

You can enlarge still images recorded on the “Memory Stick.”

The POWER switch should be set to (MEMORY).
Operate by touching the panel.

(1) Play back the image to enlarge in the frame.
(2) Press FN and select PAGE2.
(3) Press PB ZOOM. The PB ZOOM screen appears.
(4) Press the area you want to enlarge in the frame.
The area you pressed moves to the center of the screen, and the playback image is enlarged to about twice the size. If you then press another area, that area moves to the center of the screen.
(5) Adjust the zoom ratio by the power zoom lever.
You can select the image from approximately 1.1 times up to 5 times its size.
W: Decrease the zoom ratio.
T : Increase the zoom ratio.



To cancel memory PB ZOOM

Press ↩ END.

In memory PB ZOOM
If you press DISPLAY/BATTERY INFO, the frame on the memory PB ZOOM screen disappears. You cannot move the part you pressed to the center of the screen.

Edge of an enlarged image
The edge of an enlarged image cannot be displayed in the center of the screen.

Moving pictures recorded on the “Memory Stick”
Memory PB ZOOM does not work.

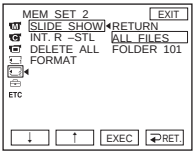
To record images processed by memory PB ZOOM to the “Memory Stick”
Press PHOTO to record images during display. The image size will be 640 × 480.

Playing back images continuously – Slide show

You can play back all the images in the “Memory Stick” or in the specified folder using slide show.

The POWER switch should be set to (MEMORY).
Operate by touching the panel.

(1) Press FN to display PAGE1.
(2) Press MENU to display the menu.
(3) Select SLIDE SHOW in 2, then press EXEC (p. 172).



(4) Select ALL FILES or FOLDER □□□*, then press EXEC.
ALL FILES: To play back all of the images in the “Memory Stick”
FOLDER □□□*: To play back the images in the folder selected with PB FOLDR
* The folder name is displayed in the □□□.
(5) Press START. Your camcorder plays back the images recorded on the “Memory Stick” in sequence. When all images are played back, slide show automatically stops.

To cancel slide show
Press ⮌ END.

To pause slide show
Press PAUSE.

To return to FN
Press ⮌ END to return to PAGE1, then press EXIT.

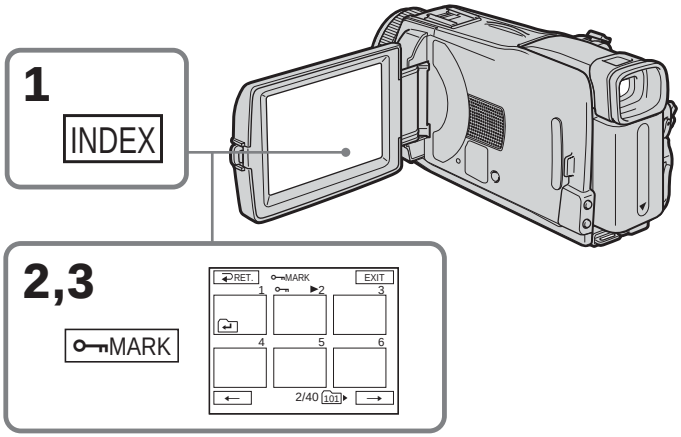
To start slide show from a particular image
Select a desired image using –/+ buttons before step 5.

Preventing accidental erasure – Image protection

To prevent accidental erasure of important images, you can protect selected images.

The POWER switch should be set to (MEMORY).
Operate by touching the panel.

(1) Press INDEX to display the index screen.
(2) Press MARK. The screen to protect the image appears.
(3) Press the image you want to protect. The indicator appears above the protected image.



To return to FN

Press EXIT.

To cancel image protection

Press the image you want to cancel image protection in step 3 again.
The indicator disappears from the image.

Note

Formatting erases all information on the "Memory Stick," including the protected image data. Check the contents of the "Memory Stick" before formatting.

If the write-protect tab on the "Memory Stick" is set to LOCK

You cannot carry out or cancel image protection.

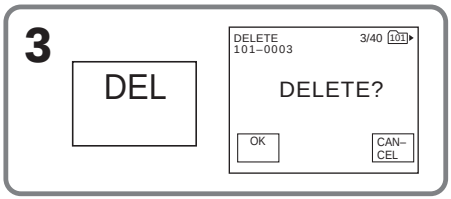
Deleting images – DELETE

You can delete all images or selected images.

Deleting selected images

The POWER switch should be set to (MEMORY).
Operate by touching the panel.

(1) Play back the image you want to delete.
(2) Press FN to display PAGE1.
(3) Press DEL. The DELETE? indicator appears on the screen.
(4) Press OK. The selected image is deleted.



To return to FN

Press EXIT.

To cancel deleting an image

Press CANCEL in step 4.

Notes

- To delete a protected image, first cancel image protection.
- Once you delete an image, you cannot restore it. Check the images to delete carefully before deleting them.

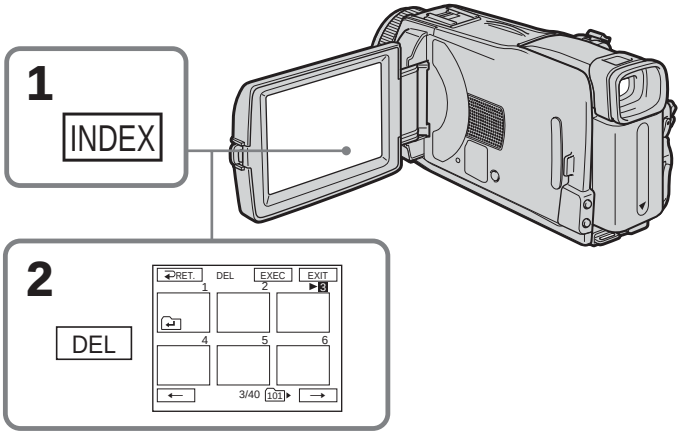
If the write-protect tab on the "Memory Stick" is set to LOCK

You cannot delete images.

Deleting selected images on the index screen

The POWER switch should be set to (MEMORY).
Operate by touching the panel.

(1) Press INDEX to display the index screen.
(2) Press DEL. Then press the image you want to delete. The number of the selected image is highlighted.
(3) Press EXEC. The DELETE? indicator appears on the screen.
(4) Press OK. The selected images are deleted.



To return to FN

Press EXIT.

To cancel deleting an image

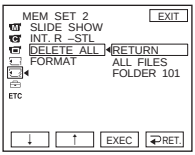
Press CANCEL in step 4.

Deleting all the images

You can delete all the unprotected images in the "Memory Stick."

The POWER switch should be set to MEMORY.
Operate by touching the panel.

(1) Press FN to display PAGE1.
(2) Press MENU to display the menu.
(3) Select DELETE ALL in 2, then press EXEC (p. 172).



(4) Select ALL FILES or FOLDER □□□*, then press EXEC.
ALL FILES: To delete all of the images in the "Memory Stick"
FOLDER □□□*: To delete the image in the folder selected with PB FOLDR
* The folder name is displayed in the □□□.
(5) Select OK, then press EXEC.
OK changes to EXECUTE.
(6) Select EXECUTE, then press EXEC.
The DELETING indicator appears, then flashes on the screen.
When all the unprotected images are deleted, the COMPLETE indicator appears.

To return to FN

Press EXIT.

To cancel deleting all the images in the "Memory Stick"

Select RETURN in step 5 or 6, then press EXEC.

While the DELETING indicator appears
Do not turn the POWER switch or press any buttons.

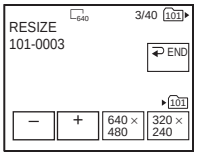
Deleting all the images
You cannot delete the folders.

Changing image size – Resize

You can change the image size of recorded still images to 640 × 480 or 320 × 240.
Reducing the image size is convenient for use in attachments to e-mail.
The original image is retained even after resizing.

The POWER switch should be set to (MEMORY).
Operate by touching the panel.

(1) During memory playback, press FN and select PAGE2.
(2) Press RESIZE.
The RESIZE screen appears.



(3) Press 640 × 480 or 320 × 240.
The image is recorded as the most recently used file in the selected folder to record.

To change still images

Press –/+ before step 3.

To return to FN

Press ↩ END to return to PAGE2, then press EXIT.

Notes

- You cannot resize the picture recorded with MPEG MOVIE recording.
- You may not be able to change the size of an image recorded with another camcorder.
- You cannot choose the image quality when you resize the image.

Memory capacity after resizing

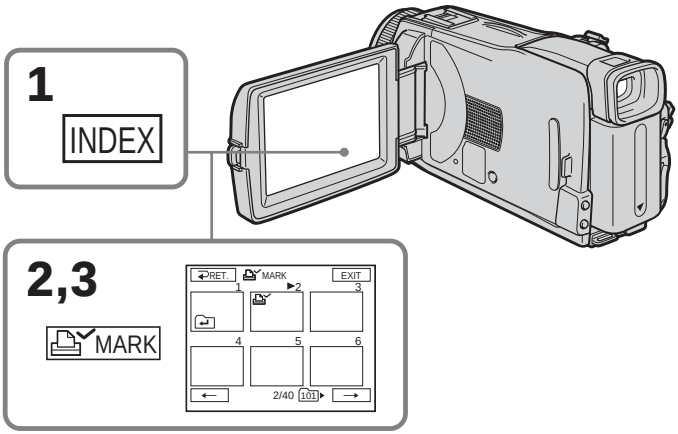
Image size	Memory capacity
640 × 480	About 150 KB
320 × 240	About 16 KB

Writing a print mark – Print mark

This function is useful for printing out still images later. (You cannot specify the number for printouts.)
Your camcorder conforms with the DPOF (Digital Print Order Format) standard for specifying the still images to print out.

The POWER switch should be set to (MEMORY).
Operate by touching the panel.

(1) Press INDEX to display the index screen.
(2) Press MARK. The screen to write a print mark appears.
(3) Press the image you want to write a print mark. The appears on the selected image.



To return to FN
Press EXIT.

To cancel writing print marks
Press the image you want to cancel the print mark in step 3 again. The disappears from the image.

If the write-protect tab on the "Memory Stick" is set to LOCK
You cannot write or cancel print marks on still images.

Moving pictures
You cannot write print marks on moving pictures.

Viewing images with a computer – Introduction

There are following ways of connecting your camcorder to a computer in order to view images saved on the "Memory Stick" or recorded on the tape on a computer.

To view images on a computer which has a Memory Stick slot, first eject the "Memory Stick" from your camcorder, then insert it into your computer's Memory Stick slot.

	Camcorder connection jack	Connection cable	Computer environment requirements	Reference pages	
				For Windows Users	For Macintosh Users
Tape image/ live from your camcorder	USB jack	USB cable (supplied)	USB port, editing software	140 – 142 144 – 145 150 – 153	—
	DV Interface	i.LINK cable (optional)	DV port, editing software	138	—
"Memory Stick" image	USB jack	USB cable (supplied)	USB port, editing software	140 – 143 146 157 – 159	160 – 162

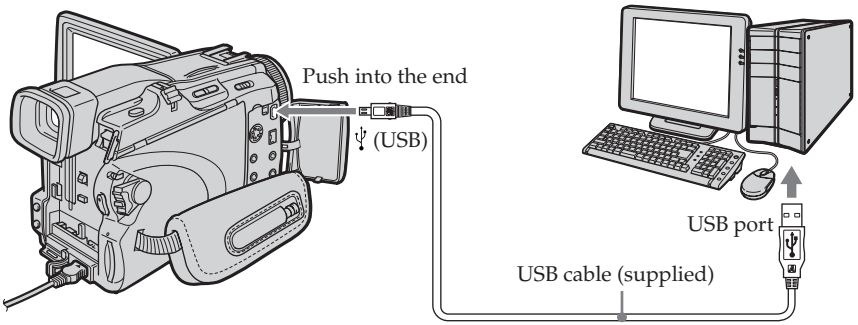
When connecting to a computer with the USB port, complete installation of the USB driver before connecting your camcorder to the computer. If you connect your camcorder to the computer first, you will not be able to install the USB driver correctly.

For details about the computer's ports and editing software, contact the computer manufacturer.

Viewing pictures recorded on the tape

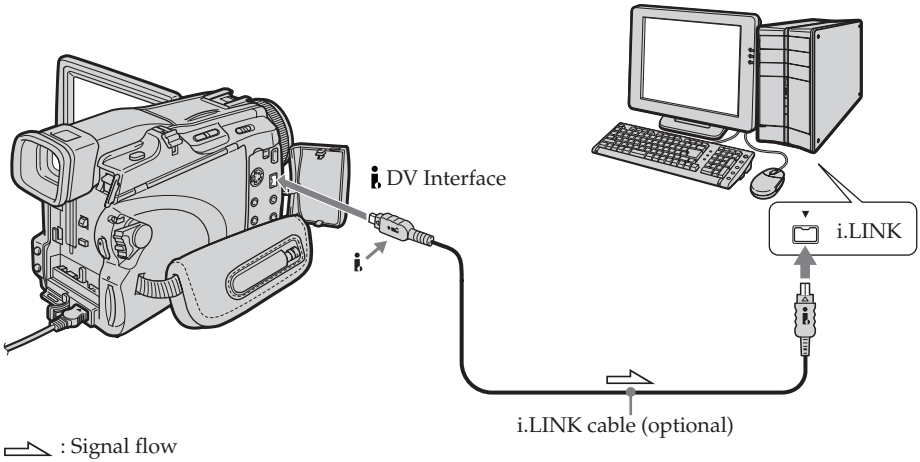
When connecting to a computer with the USB port

See page 140 for details.



When connecting to a computer with the DV port

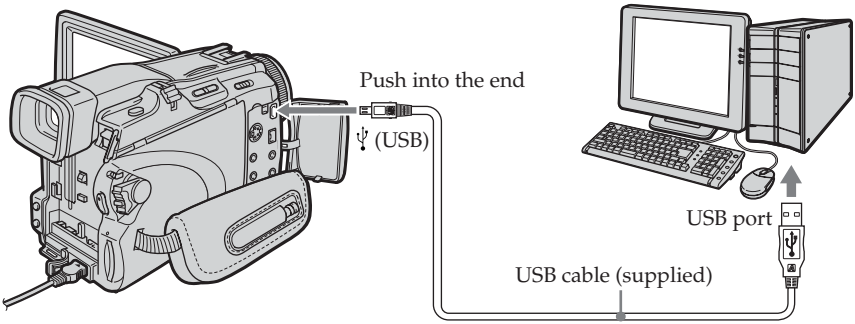
The computer must have a DV port and editing software installed that can read video signals.



Viewing images recorded on the "Memory Stick"

When connecting to a computer with the USB port

See page 140 when using Windows and page 160 when using Macintosh.



You can also use a "Memory Stick" Reader/Writer (optional).

When connecting to the computer without a USB port

Use an optional floppy disk adaptor for Memory Stick or a PC card adaptor for Memory Stick.

When purchasing an accessory, check its catalog beforehand for the recommended operating environment.

Notes on using a computer

"Memory Stick"

- "Memory Stick" operations on your camcorder cannot be assured if the "Memory Stick" formatted on a computer is used on your camcorder, or if the "Memory Stick" in your camcorder was formatted from the computer when the USB cable was connected.
- Do not compress the data on the "Memory Stick." Compressed files cannot be played back on your camcorder.

Software

- Depending on your application software, the file size may increase when you open a still image file.
- When you load an image modified using retouching software from a computer to your camcorder or when you directly modify the image on your camcorder, the image format will differ so a file error indicator may appear and you may be unable to open the file.

Communications with a computer

Communications between your camcorder and a computer may not recover after recovering from Suspend, Resume, or Sleep.

Connecting your camcorder to a computer using the USB cable (For Windows users)

Complete installation of the USB driver before connecting your camcorder to a computer. If you connect your camcorder to a computer first, you will not be able to install the USB driver correctly.

When connecting to a computer with the USB port

You must **install a USB driver** onto the computer in order to connect your camcorder to the computer's USB port. The USB driver can be found on the CD-ROM supplied, along with the application software required for viewing images.
If you connect your camcorder and a computer using the USB cable, you can view pictures live from your camcorder and pictures recorded on the tape on a computer (USB Streaming function).
Furthermore, if you download pictures from your camcorder to a computer, you can process or edit them in image processing software and append them to e-mail.
You can view images recorded on the "Memory Stick" on a computer.

Recommended computer usage environment when connecting with the USB cable and viewing tape pictures on a computer

OS:
Microsoft Windows 98SE, Windows Me, Windows 2000 Professional, Windows XP Home Edition or Windows XP Professional
Standard installation is required.
However, operation is not assured if the above environment is an upgraded OS.
You cannot hear sound if a computer is running Windows 98, but you can read still images.
CPU:
Minimum 500 MHz Intel Pentium III or faster (800 MHz or faster recommended)
Application:
DirectX 8.0a or later
Sound system:
16 bit stereo sound card and stereo speakers
Memory:
64MB or more
Hard disk:
Available memory required for installation:
at least 250MB
Available hard disk memory recommended:
at least 1GB (depending on the size of the image files edited)
Display:
4MB VRAM video card, Minimum 800 × 600 dot High color (16 bit color, 65,000 colors), Direct Draw display driver capability (At 800 × 600 dot or less, 256 colors and less, this product will not operate correctly.)
Others:
This product is based on DirectX technology, so it is necessary to install DirectX.

The USB port must be provided as standard.

You cannot use this function in the Macintosh environment.

Recommended computer usage environment when connecting with USB cable and viewing the "Memory Stick" images on a computer

Recommended Windows environment

OS:

Microsoft Windows 98, Windows 98SE, Windows Me, Windows 2000 Professional, Windows XP Home Edition or Windows XP Professional
Standard installation is required.
However, operation is not assured if the above environment is an upgraded OS.

CPU:

MMX Pentium 200 MHz or faster

Display:

Minimum 800 × 600 dot High color (16 bit color, 65,000 colors). (At 800 × 600 dot or less, 256 colors and less, the screen for installing USB driver is not displayed.)

Others:

The USB port must be provided as standard.
Windows Media Player must be installed (to play back moving pictures).

Notes

- Operations are not guaranteed for the Windows environment if you connect two or more USB equipment to a single computer at the same time, or when using a hub.
- Some equipment may not operate depending on the type of USB equipment that is used simultaneously.
- Operations are not guaranteed for all the recommended computer environments mentioned above.
- Windows and Windows Media are registered trademarks of Microsoft Corporation in the United States and/or other countries.
- Pentium is trademark or registered trademark of Intel Corporation.
- All other product names mentioned herein may be the trademarks or registered trademarks of their respective companies. Furthermore, "TM" and "®" are not mentioned in each case in this manual.

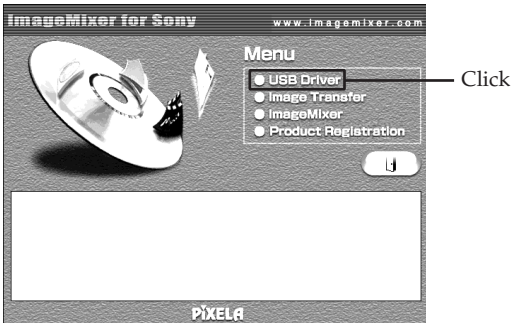
Installing the USB driver

Start the following operation without connecting the USB cable to the computer.
Connect the USB cable according to "Making the computer recognize your camcorder."

If you are using Windows 2000, log in with permission of administrators.
If you are using Windows XP, log in with permission of computer administrators.

(1) Turn on a computer and allow Windows to load.
(2) Insert the supplied CD-ROM in the CD-ROM drive of the computer. The application software starts up.
If the screen does not appear, double-click "My Computer," then "ImageMixer" (CD-ROM Drive).
(3) Select "Handycam" on the screen.

The title screen appears.
(4) Move the cursor to "USB Driver" and click. This starts USB driver installation.



(5) Follow the on-screen messages to install the USB driver.
(6) Remove the CD-ROM, then restart the computer and follow the on-screen messages.

Notes

- If you connect the USB cable before USB driver installation is complete, the USB driver will not be properly registered. Carry out installation again following the on-screen messages.
- The title screen is not displayed if the screen size of the computer is set to less than 800 × 600 dots and 256 colors or less. See page 140, 141 about the recommended computer environment.

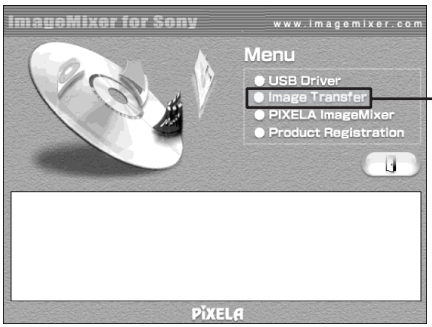
Installing Image Transfer

Make sure USB driver installation is complete.

This function enables image data recorded on the “Memory Stick” to be automatically transferred (copied) to a computer.

If you are using Windows 2000, log in with permission of administrators.
If you are using Windows XP, log in with permission of computer administrators.

(1) Turn on the computer and allow Windows to load.
(2) Insert the supplied CD-ROM in the CD-ROM drive of the computer. The application software starts up.
(3) Select “Handycam” on the screen.
The title screen appears.
(4) Move the cursor to “Image Transfer” and click.



The Install Wizard program starts up and the “Choose Setup Language” screen appears.
(5) Select the language for installation.
(6) Follow the on-screen messages.
The installation screen disappears when installation is complete.

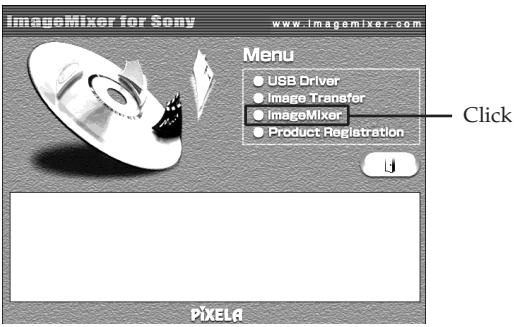
Installing ImageMixer

Make sure USB driver installation is complete.

"ImageMixer Ver.1.5 for Sony" is an application that can capture or edit images, or create video CDs.

To install and use this software in Windows 2000, you must be authorized as administrators. For Windows XP, you must be authorized as computer administrators.

(1) Turn on a computer and allow Windows to load.
(2) Insert the supplied CD-ROM into the CD-ROM drive of the computer.
The application software starts up.
(3) Select "Handycam" on the screen.
The title screen appears.
(4) Move the cursor to "ImageMixer" and click.



The Install Wizard program starts up and the "Choose Setup Language" screen appears.
(5) Select the language for installation.
(6) Follow the on-screen messages.
The installation screen disappears when installation is complete.
(7) Follow the on-screen messages to install WinASPI.
(8) If DirectX 8.0a or later is not installed on the computer, continue installation after installing ImageMixer.
Follow the on-screen messages to install DirectX 8.0a. After installation is complete, restart the computer.

MEMORY MIX album

Once "ImageMixer" is installed, the MEMORY MIX album is created in "Album" of "ImageMixer" and sample images are stored in there.
Those sample images can be transferred from the MEMORY MIX album to a "Memory Stick" so that they can be used in MEMORY MIX (p. 112).
Refer to the on-line help for details on the operation procedure.

Replacing WinASPI

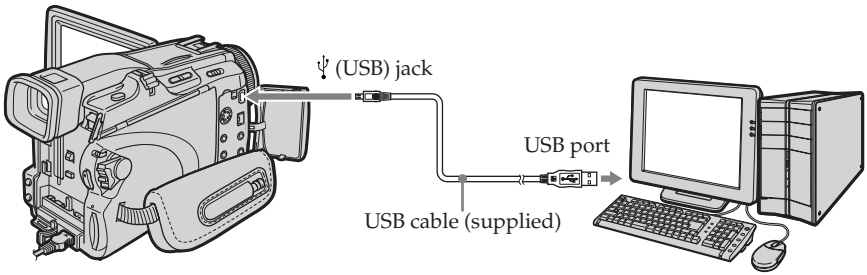
To be able to use the ImageMixer CD writing function, you need to install WinASPI. If a different writing application was previously installed, its writing function may not work correctly. If that happens, reinstall the original application and replace WinASPI.
Note that the ImageMixer CD writing function may not work properly.

Making the computer recognize your camcorder

If you are using Windows 2000, log in with permission of administrators.
If you are using Windows XP, log in with permission of computer administrators.

Viewing pictures recorded on the tape

(1) Connect the AC Adaptor, then set the POWER switch to VCR.
(2) Press FN to display PAGE1.
(3) Press MENU to display the menu.
(4) Select USB STREAM in [toolbox], then press EXEC (p. 175).
(5) Select ON, then press EXEC.
(6) Connect the ψ (USB) jack on your camcorder to the USB port on the computer using the supplied USB cable.
The computer recognizes your camcorder, and the Windows Add Hardware Wizard starts.



(7) Follow the on-screen messages so that the Add Hardware Wizard recognizes that the USB drivers have been installed. Be sure to allow the installation to complete without interrupting it.

For Windows 2000, Windows XP users

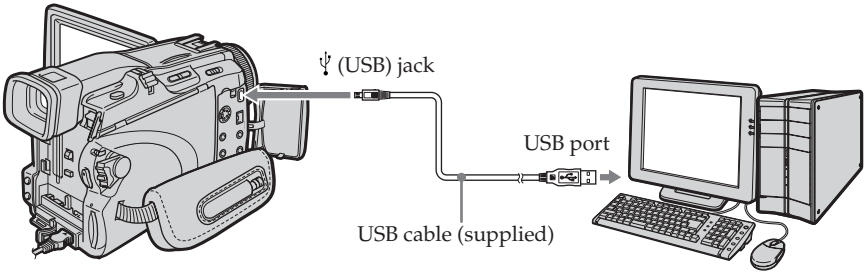
When the dialog box to confirm the digital signature appears, select "Yes" if you use Windows 2000 or select "Continue Anyway" if you use Windows XP.

Viewing images recorded on the "Memory Stick"

(1) Insert the "Memory Stick" into your camcorder.

(2) Connect the AC Adaptor, then set the POWER switch to MEMORY.

(3) Connect the ψ (USB) jack on your camcorder to the USB port on the computer using the supplied USB cable.
The USB MODE indicator appears on the LCD screen of your camcorder. The computer recognizes your camcorder, and the Add Hardware Wizard starts.



(4) Follow the on-screen messages so that the Add Hardware Wizard recognizes that the USB drivers have been installed. The Add Hardware Wizard starts two times because two different USB drivers are installed. Be sure to allow the installation to complete without interrupting it.

You cannot install the USB driver if the "Memory Stick" is not in your camcorder
Be sure to insert the "Memory Stick" into your camcorder before installing the USB driver.

If you cannot install the USB driver

The USB driver has been registered incorrectly as a computer was connected to your camcorder before installation of the USB driver was complete. Follow the procedure below to correctly install the USB driver.

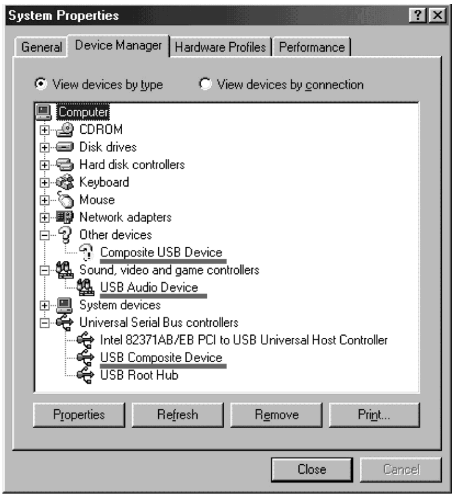
Viewing pictures recorded on the tape

Step 1: Uninstall the incorrect USB driver

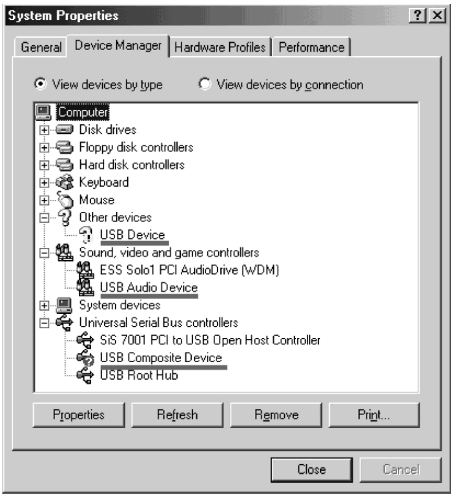
① Turn on the computer and allow Windows to load.
② Connect the AC Adaptor, then set the POWER switch to VCR.
③ Connect the USB port on the computer to the ψ (USB) jack on your camcorder using the USB cable supplied.
④ Open the computer's "Device Manager."

Windows XP:
Select "Start" → "Control Panel" → "System" → "Hardware," and click the "Device Manager" button.
If there is no "System" inside "Pick a category" after clicking "Control Panel," click "Switch to classic view" instead.
Windows 2000:
Select "My Computer" → "Control Panel" → "System" → "Hardware" tab, and click the "Device Manager" button.
Windows 98SE/Windows Me:
Select "My Computer" → "Control Panel" → "System," and click "Device Manager."

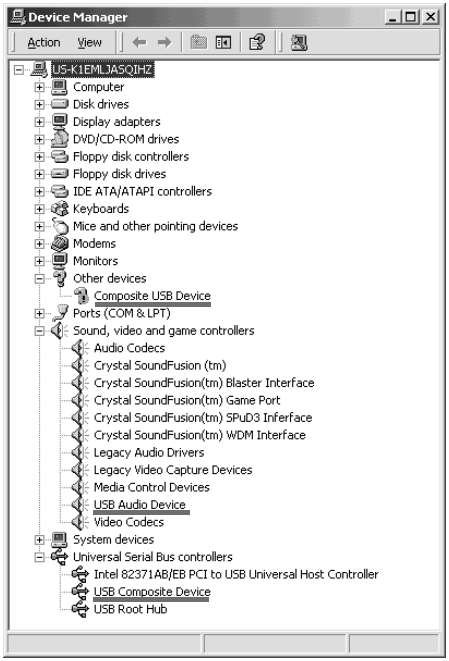
⑤ Select and delete the underlined devices below.



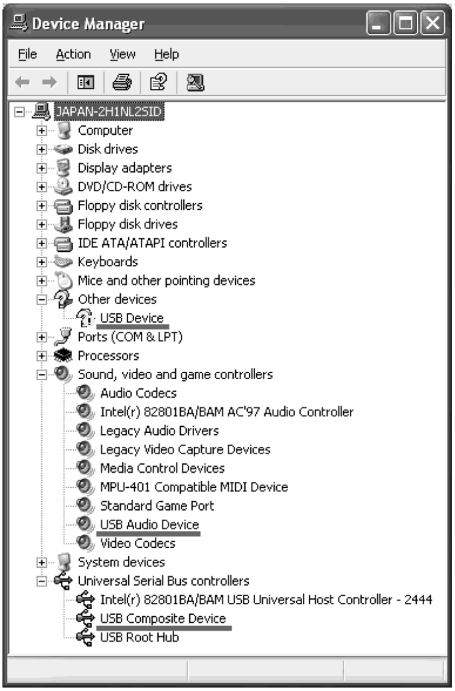
Windows 98SE



Windows Me



Windows 2000



Windows XP

⑥ Set the POWER switch to OFF (CHG) on your camcorder, then disconnect the USB cable.
⑦ Restart the computer.

Step 2: Install the USB driver on the supplied CD-ROM
Follow the entire procedure in "Installing the USB driver" on page 142.

Viewing images recorded on the "Memory Stick"

Step1: Uninstall the incorrect USB driver

① Turn on the computer and allow Windows to load.
② Insert the "Memory Stick" into your camcorder.
③ Connect the AC Adaptor, then set the POWER switch to MEMORY.
④ Connect the USB port on the computer to the ψ (USB) jack on your camcorder using the USB cable supplied.
⑤ Open the computer's "Device Manager."

Windows XP:
Select "Start" → "Control Panel" → "System" → "Hardware" tab and click the "Device Manager" button.
If there is no "System" inside "Pick a category" after clicking "Control Panel," click "Switch to classic view" instead.
Windows 2000:
Select "My Computer" → "Control Panel" → "System" → "Hardware," and click the "Device Manager" button.
Other OS:
Select "My Computer" → "Control Panel" → "System," and click "Device Manager."

⑥ Select "Other devices."
Select the device prefixed with the "?" mark and delete.
Ex: (?)Sony Handycam
⑦ Set the POWER switch to OFF (CHG) on your camcorder, then disconnect the USB cable.
⑧ Restart the computer.

Step2: Install the USB driver on the supplied CD-ROM
Follow the entire procedure in "Installing the USB driver" on page 142.

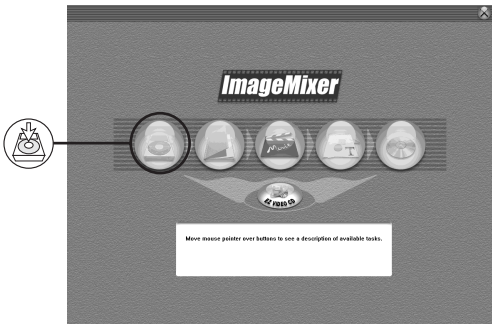
Viewing pictures recorded on tape on a computer – USB Streaming (For Windows users)

Capturing images with "ImageMixer Ver.1.5 for Sony"

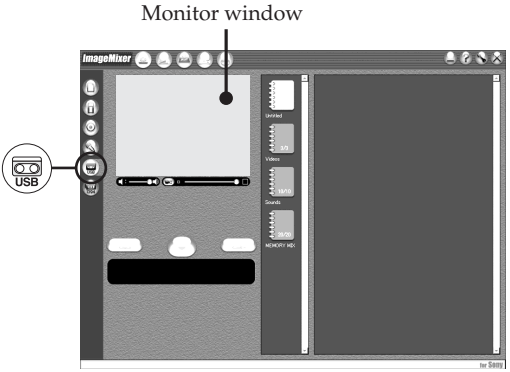
You need to install the USB driver and ImageMixer to view pictures recorded on the tape on a computer (p. 142).

Viewing pictures recorded on the tape

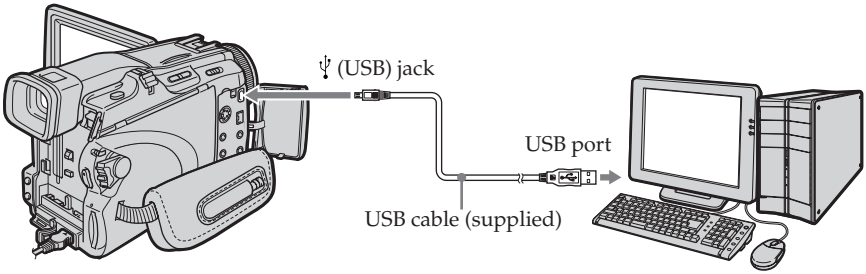
(1) Turn on the computer and allow Windows to load.
(2) Connect the AC Adaptor, then insert the cassette into your camcorder.
(3) Set the POWER switch to VCR.
(4) Press FN to display PAGE1.
(5) Press MENU to display the menu.
(6) Select USB STREAM in [📁], then press EXEC (p. 175).
(7) Select ON, then press EXEC.
(8) Select "Start" → "Programs" → "PIXELA" → "ImageMixer" → "ImageMixer Ver.1.5 for Sony."
The "ImageMixer Ver.1.5 for Sony" startup screen appears on the computer. The title screen appears.
(9) Click (USB) on the screen.



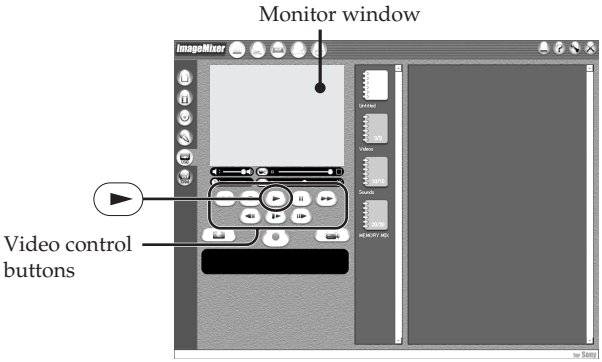
(10) Click (USB).



(11) Connect the ⚶ (USB) jack on your camcorder to the USB port on the computer using the supplied USB cable.



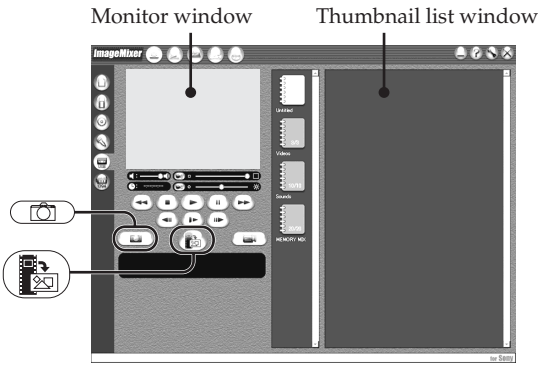
(12) Click ► to start playback.
You can control video operations with the buttons on the screen.
The picture from the tape appears on the monitor window on the computer.



Viewing pictures live from your camcorder

(1) Follow the step 1 and 2 on page 150.
(2) Set the POWER switch to CAMERA.
(3) Follow the step 4 to 11 on pages 150, 151.
The picture from your camcorder appears on the monitor window on the computer.

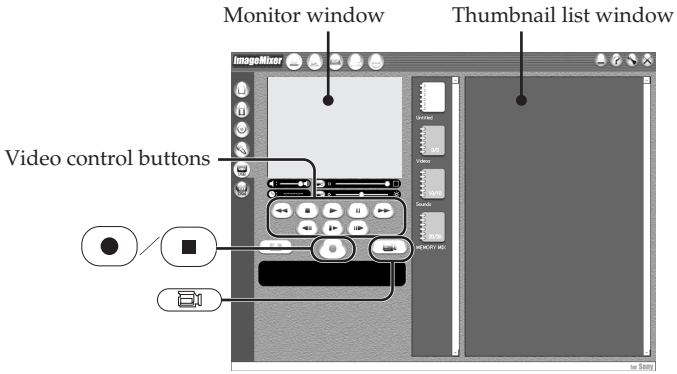
Capturing still images



(1) Click .

(2) Looking at the monitor window, move the cursor to and click it at the point you want to capture.
The still image on the screen is captured.
Captured images appear in the thumbnail list window.

Capturing moving pictures



(1) Click .
(2) Click to start playback.
(3) Looking at the monitor window, click at the first scene of the movie you want to capture. changes to .
(4) Looking at the monitor window, click at the last scene you want to capture.
The moving picture is captured. The captured images appear in the thumbnail list window.

To close "ImageMixer"

Click ⊗ in the upper right corner of the screen.

Notes

- When you view images on a computer with the USB connection, the following may occur. This is not a malfunction.
  – The image shakes up and down.
  – Some images are not displayed correctly due to noise, etc.
  – Some images are displayed with the cracking noise.
  – Images of different color systems to that of your camcorder are not displayed correctly.
- When your camcorder is during standby with a cassette inserted, it turns off automatically after five minutes.
- We recommend setting DEMO MODE to OFF in the menu settings when your camcorder is during standby, and no cassette is inserted.
- Indicators on the screen of your camcorder do not appear on images that are captured into the computer.
- If you capture a fast moving picture, the monitor window may not move smoothly. You can make the picture move more smoothly by shifting the upper right slider on the bottom of the monitor window to the left, although this reduces the picture quality.
- You cannot carry out any "Memory Stick" operations during the USB Streaming function.

If image data cannot be transferred by the USB connection

The USB driver has been registered incorrectly as the computer was connected to your camcorder before installation of the USB driver was complete. Reinstall the USB driver following the procedure on page 147.

If any trouble occurs

Close all running applications, then restart the computer.

Carry out the following operations after quitting the application:

– Disconnect the USB cable.
– Turn the POWER switch to the other position on your camcorder.

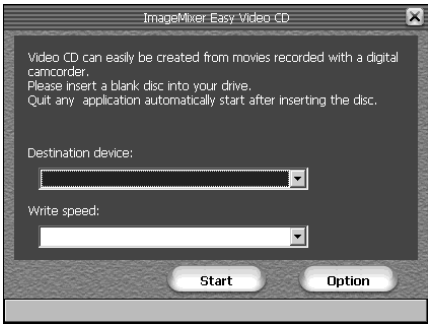
Making Video CDs – Easy Video CD

This function makes it simple to create a video CD by capturing images recorded on a tape or images live from your camcorder.

Capturing images recorded on a tape onto a CD-R

(1) Follow the step 1 to 8 on page 150.
(2) Press ■ after choosing the point on the tape from which you want to capture images onto the CD-R.
(3) Click .

(4) Connect the (USB) jack on your camcorder to the USB port on the computer using the supplied USB cable.
(5) Insert a new CD-R in the CD-R drive of the computer.
(6) Click "Start."


ImageMixer Easy Video CD
Video CD can easily be created from movies recorded with a digital camcorder.
Please insert a blank disc into your drive.
Quit any application automatically start after inserting the disc.
Destination device:
Write speed:
Start
Option

The tape is automatically played back. Easy Video CD automatically begins to capture images onto the CD-R to create a Video CD.
(7) After the "Video CD successfully created." message appears, click "Quit."

Capturing images live from your camcorder onto a CD-R

Eject the cassette before operation. Your camcorder automatically turns off after about five minutes if the cassette is inserted.

(1) Follow the step 1 and 2 on page 150.
(2) Set the POWER switch to CAMERA on your camcorder.
(3) Follow the step 4 to 8 on page 150.
(4) Follow the step 3 to 7 in "Capturing images recorded on a tape onto a CD-R."

Notes

- A computer equipped with a CD-R drive is required.
- Do not press the buttons on your camcorder while creating a Video CD. If you press ■, only images up to that point are captured onto the Video CD and Easy Video CD is closed.
- Once a disc has been created you cannot add images to it.
- Select a hard disc with sufficient memory (at least 6GB) from the "Option" screen as a location for the "Location of work folder."

Playing back Video CDs

You can use a DVD player or a computer with a DVD drive to play back the Video CDs you create.
To play back Video CDs on a computer, you need to have Video CD software installed.

You can play back Video CDs with Windows Media Player. However you cannot use menu functions such as capturing function. You also may not be able to play back Video CDs in certain computer environment such as OS or hardware.

(1) Start up Windows Media Player.

Windows XP:
Select "Start" → "All Programs" → "Accessory" → "Entertainment," and click "Windows Media Player."
Other OS:
Select "Start" → "Programs" → "Accessory" → "Entertainment," and click "Windows Media Player."

(2) Select "My Computer" → "CD-R," and click "MPEGAV" folder, then drag and drop the "□□□*.DAT" moving picture file onto the Media Player screen. The moving picture will be played back.

* The file name is displayed in the □□□.

Created Video CDs

The maximum recording time is about one hour.
Capturing is divided into segments of about 10 minutes (approximately 4GB) due to the specifications of the AVI capturing format. As a result, recording includes segment links about every 10 minutes, at which point images are skipped for several seconds.

Seeing the on-line help (operating instructions) of ImageMixer

A "ImageMixer Ver.1.5 for Sony" on-line help site is available where you can find the detailed operating method of "ImageMixer Ver.1.5 for Sony."

(1) Click ⓘ located in the upper-right corner of the screen.
The ImageMixer's Manual screen appears.
(2) You can find the information you need from the list of contents.

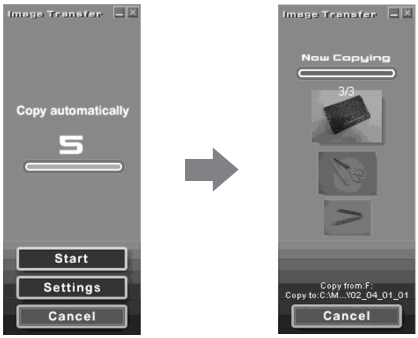
To close on-line help
Click ☒ at the top right of the screen.

If you have any questions about ImageMixer
"ImageMixer Ver.1.5 for Sony" is the product of PIXELA corporation. For details, refer to the operating instructions of the CD-ROM supplied with your camcorder.

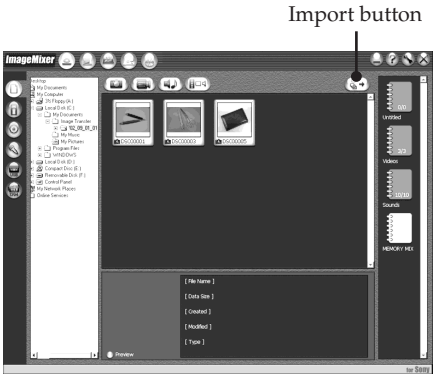
Viewing images recorded on “Memory Stick” on a computer (For Windows users)

The image data recorded on the “Memory Stick” is automatically transferred (copied) to a computer with Image Transfer. You can view images with ImageMixer.
You need to install the USB diver, Image Transfer and ImageMixer to view the “Memory Stick” images on a computer (p. 142 to 144).

(1) Turn on your computer and allow Windows to load.
(2) Insert the “Memory Stick” into your camcorder, then connect the AC Adaptor to your camcorder.
(3) Set the POWER switch to MEMORY.
(4) Connect the (USB) jack on your camcorder to the USB port on the computer using the supplied USB cable.
(5) Image Transfer automatically starts up and the transfer of image data begins.



(6) ImageMixer automatically starts up, enabling you to view the copied image.



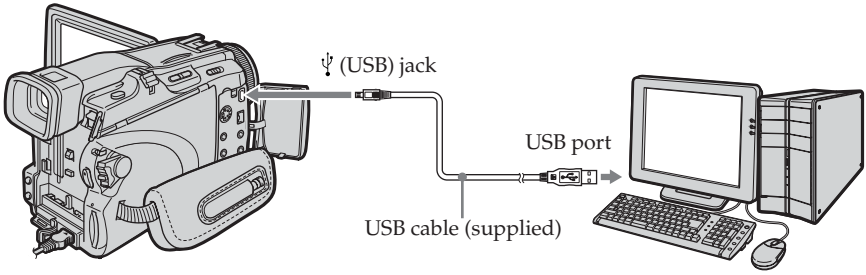
(7) Select an album and the image, then press the import button. The image is added in your album, and you can edit the image.

Viewing images without Image Transfer

Before operation

- You need to install the USB driver to view the "Memory Stick" images on a computer (p. 142).
- An application such as Windows Media Player must be installed to play back moving pictures in Windows environment.

(1) Turn on the computer and allow Windows to load.
(2) Insert the "Memory Stick" into your camcorder, then connect the AC Adaptor to your camcorder.
(3) Set the POWER switch to MEMORY.
(4) Connect the ψ (USB) jack on your camcorder to the USB port on the computer using the supplied USB cable.
The USB MODE indicator appears on the screen of your camcorder.



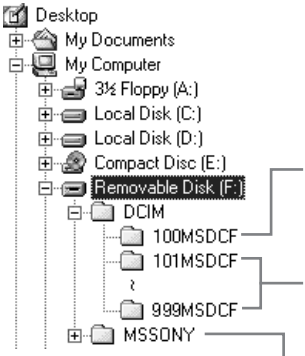
(5) Open "My Computer" on Windows and double-click the newly recognized drive (Example: "Removable Disk (F:)").
The folders inside the "Memory Stick" appear.
(6) Double-click a desired image file from the folder in this order.
"DCIM" folder → "□□□MSDCF" folder[1)] → Image file[2)]
See "Image file storage destinations and image files" (p. 159), for the detailed folder and file name.

[1)] □□□ stands for any number (within the range) from 101 to 999.
[2)] Copying a file to the hard disk of the computer before viewing it is recommended. If you play back the file directly from the "Memory Stick," the image and sound may break off.

Image file storage destinations and image files

Image data recorded with your camcorder is stored in a folder in the "Memory Stick." The meanings of the file names are as follows. □□□□ stands for any number within the range from 0001 to 9999.

Example: For Windows Me users (The drive recognizing your camcorder is [F:].)



Folder containing image files recorded using other camcorders without the folder creation function (for playback only)

Folder containing image files recorded with your camcorder
When no new folders have been created, this is only "101MSDCF"

Folder containing moving picture data recorded using other camcorders without the folder creation function (for playback only)

Folder	File	Meaning
101MSDCF (up to 999MSDCF)	DSC0□□□□.JPG	Still image file
	MOV0□□□□.MPG	Moving picture file

Disconnect the USB cable and eject the "Memory Stick" or set the POWER switch to OFF (CHG)

For Windows 2000, Windows Me, Windows XP users

(1) Move the cursor to the "Unplug or Eject Hardware" on the Task Tray and click to cancel the applicable drive.
(2) After the "Safe to remove" message appears, disconnect the USB cable and eject the "Memory Stick" or set the POWER switch to OFF (CHG).

Connecting your camcorder to a computer using the USB cable (For Macintosh users)

When connecting to a computer with the USB cable

You must **install a USB driver** onto a computer in order to connect your camcorder to the computer's USB port. The USB driver can be found on the CD-ROM supplied, along with the application software required for viewing images.

Recommended Macintosh environment

Mac OS 8.5.1/8.6/9.0/9.1/9.2 or Mac OS X (v10.0/v10.1/v10.2) standard installation is required.
However, note that the update to Mac OS 9.0/9.1 should be used for the following models.

- iMac with the Mac OS 8.6 standard installation and a slot loading type CD-ROM drive
- iBook or Power Mac G4 with the Mac OS 8.6 standard installation

The USB port must be provided as standard.

QuickTime 3.0 or later must be installed to play back moving pictures.

Notes

- Operations are not guaranteed for the Macintosh environment if you connect two or more USB equipment to a single computer at the same time, or when using a hub.
- Some equipment may not operate depending on the type of USB equipment that is used simultaneously.
- Operations are not guaranteed for all the recommended computer environments mentioned above.
- Macintosh, Mac OS, iBook, Power Mac and QuickTime are trademarks of Apple Computer Inc.
- All other product names mentioned herein may be the trademarks or registered trademarks of their respective companies. Furthermore, "TM" and "®" are not mentioned in each case in this manual.

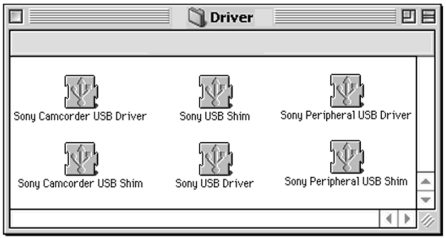
Installing the USB driver

Do not connect the USB cable to a computer before installation of the USB driver is complete.

For Mac OS 8.5.1/8.6/9.0 users

(1) Turn on the computer and allow the Mac OS to load.
(2) Insert the supplied CD-ROM in the CD-ROM drive of the computer.
The application software screen appears.
(3) Select "Handycam" on the screen.
The title screen appears.
(4) Click the "USB Driver" to open the folder containing the six files related to "Driver."

(5) Select the following two files, and drag and drop them into the System Folder.
• Sony Camcorder USB Driver
• Sony Camcorder USB Shim



(6) When the message appears, click "OK."
The USB driver is installed on the computer.
(7) Remove the CD-ROM from the computer.
(8) Restart the computer.

For Mac OS 9.1/9.2/Mac OS X (v10.0/v10.1/v10.2)
The USB driver need not be installed. Your camcorder is automatically recognized as a drive just by connecting your Mac using the USB cable.

Viewing images recorded on "Memory Stick" on a computer (For Macintosh users)

Viewing images

Before operation

- You need to install the USB driver to view the "Memory Stick" images on a computer (p. 161).
- QuickTime 3.0 or later must be installed to play back moving pictures.

(1) Turn on the computer and allow Mac OS to load.
(2) Insert the "Memory Stick" into your camcorder, then connect the AC Adaptor to your camcorder.
(3) Set the POWER switch to MEMORY.
(4) Connect the ψ (USB) jack on your camcorder to the USB port on the computer using the supplied USB cable.
The USB MODE indicator appears on the screen of your camcorder.
(5) Double-click the "Memory Stick" icon on the desktop.
The folders inside the "Memory Stick" are displayed.
(6) Double-click a desired image file from the folder in this order.
"DCIM" folder → "□□□MSDCF" folder[1] → Image file[2]

[1] □□□ stands for any number (within the range) from 101 to 999.
[2] Copying a file to the hard disk of a computer before viewing it is recommended. If you play back the file directly from the "Memory Stick," the image and sound may break off.

Disconnect the USB cable and eject the "Memory Stick" or set the POWER switch to OFF (CHG)

(1) Close all running applications.
Make sure that the access lamp of your camcorder is not lit.
(2) Drag the "Memory Stick" icon into the "Trash." Alternatively, select the "Memory Stick" icon by clicking on it, then select "Eject disk" from the "Special" menu at the top left of the screen.
(3) Disconnect the USB cable and eject the "Memory Stick" or set the POWER switch to OFF (CHG).

For Mac OS X (v10.0) users

Shut down the computer, then disconnect the USB cable and eject the "Memory Stick" or set the POWER switch to OFF (CHG).

Capturing images from an analog video unit on a computer – Signal convert function

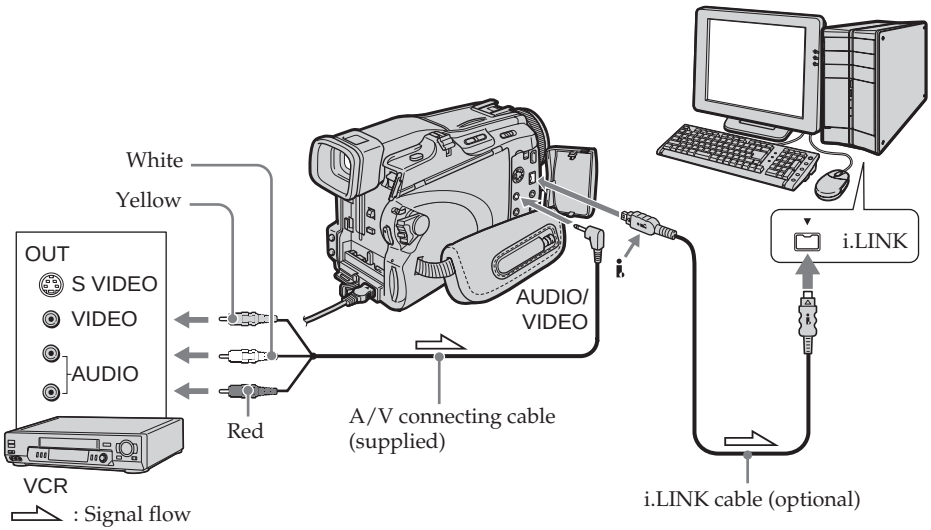
You can capture images and sound from an analog video unit connected to a computer which has the DV port to your camcorder.

Before operation

Set DISPLAY in ETC to LCD in the menu settings. (The default setting is LCD.)

The POWER switch should be set to (VCR).
Operate by touching the panel.

(1) Press FN to display PAGE1.
(2) Press MENU to display the menu.
(3) Select A/V → DV OUT in , then press EXEC (p. 170).
(4) Select ON, then press EXEC.
(5) Start playback on the analog video unit.
(6) Start capturing procedures on the computer.
The operation procedures depend on the computer and the software which you use.
For details of how to capture images, refer to the operating instructions of the computer and software.



After capturing images and sound

Stop capturing procedures on the computer, and stop playback on the analog video unit.

Notes

- You need the software and computer that support the exchange of digital video signals.
- Depending on the condition of the analog video signals, the computer may not be able to output the images correctly when you convert video signals into digital video signals via your camcorder. Depending on the analog video unit, the image may contain noise or incorrect colors.
- You cannot record or capture the video output via your camcorder when the video tape include copyright protection signals such as the ID-2 system.

If the computer has a USB port

You can connect using a USB cable, but images may not be transferred smoothly.

If your VCR has an S video jack

Pictures can be reproduced more faithfully by using an S video cable (optional).
With this connection, you do not need to connect the yellow (video) plug of the A/V connecting cable.
Connect an S video cable (optional) to the S video jacks of both your camcorder and the VCR.

Accessing the network

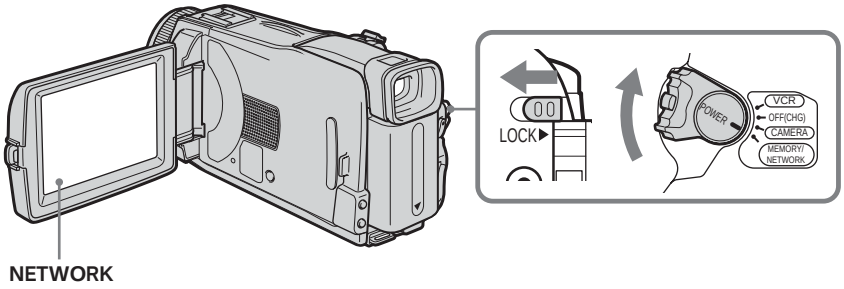
– DCR-TRV39 only

You can access the Internet using a dedicated accessory that serves as a USB Network Adaptor.
Once the access is made, you can view a Web page, send/receive your e-mail, etc. This section describes only how to open the network menu.

The POWER switch should be set to (MEMORY/NETWORK).
Operate by touching the panel.

Press NETWORK.
The network menu appears.

For details, refer to the Network Function/Application Operating Instructions supplied with your camcorder.



Notes

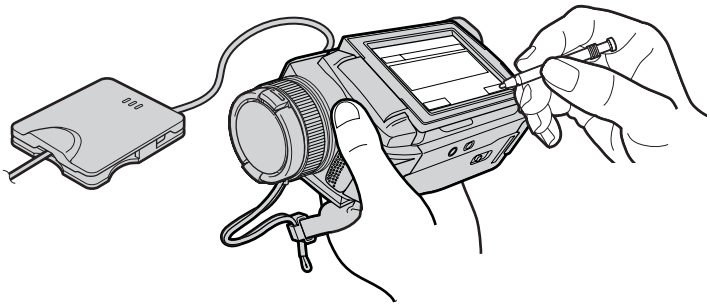
- Make sure that your camcorder is during standby with the POWER switch set to MEMORY/NETWORK.
- Do not remove the power source while operating the network functions or your network settings may be erased. Also, close the network function before you turn the POWER switch.

On trademarks

All other product names mentioned herein may be the trademarks or registered trademarks of their respective companies. Furthermore, “TM” and “®” are not mentioned in each case in this manual.

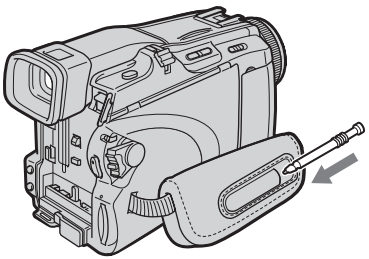
How to hold your camcorder when operating network functions

Hold your camcorder with your hand through the grip belt to keep from dropping it. The operation buttons needed for network functions appear on the LCD screen. Press the buttons with the stylus supplied.



After using the stylus

Put it back in the stylus holder. Hold the stylus correctly as illustrated and insert it until it clicks.



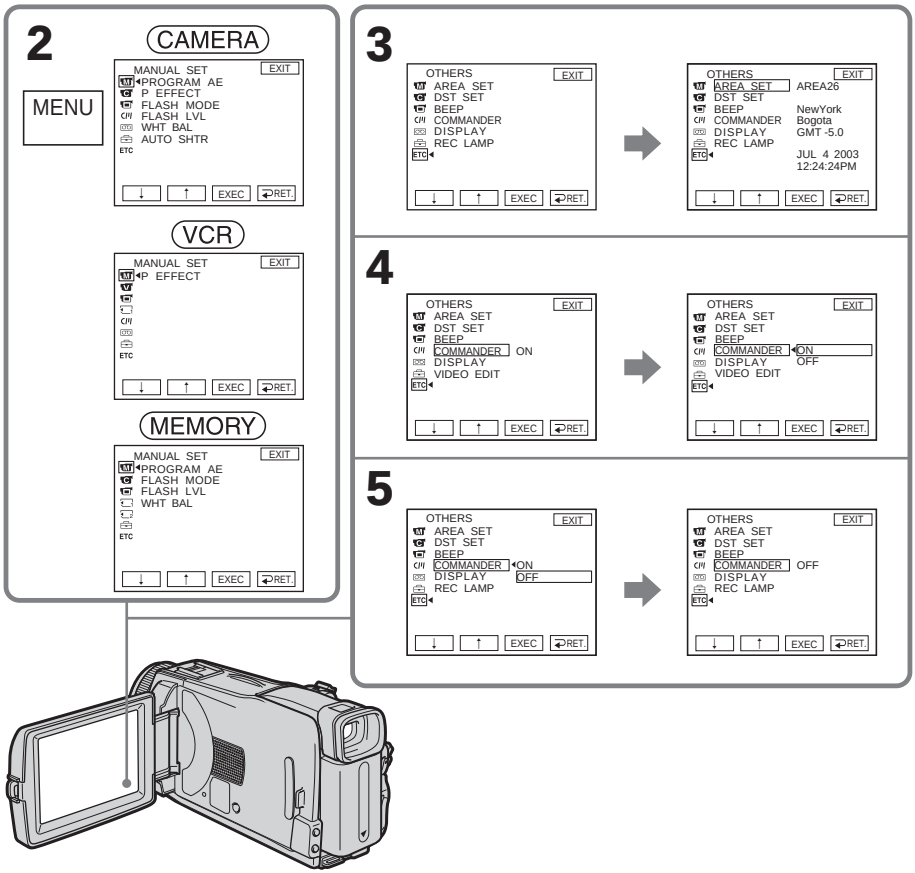
Changing the menu settings

To change the mode settings in the menu settings, select the menu items with ↓/↑. The default settings can be partially changed. First, select the icon, then the menu item and the mode.

The POWER switch should be set to (CAMERA), (VCR) or (MEMORY). Operate by touching the panel.

(1) Press FN to display PAGE1.
(2) Press MENU to display the menu.
(3) Press ↓/↑ to select a desired icon, then press EXEC.
(4) Press ↓/↑ to select a desired item, then press EXEC.
(5) Press ↓/↑ to select a desired setting, then press EXEC.
(6) Repeat step 3 to 5 if you want to change other items. Press ⮌ RET. to return to step 3.

See “Selecting the mode setting of each item” for details (p. 168).



To return to FN

Press EXIT.

Menu items are displayed as the following icons:

- MANUAL SET
- CAMERA SET
- VCR SET
- LCD/VF SET
- MEM SET 1
- MEM SET 2
- CM SET
- TAPE SET
- SETUP MENU
- OTHERS

Selecting the mode setting of each item

● is the default setting.

Menu items differ depending on the position of the POWER switch.
The screen shows only the items you can operate at the moment.

Icon/item	Mode	Meaning	POWER switch
MANUAL SET			
PROGRAM AE	——	To suit your specific shooting requirement (p. 58)	CAMERA MEMORY
P EFFECT	——	To add special effects like those in movies or on the TV to images (p.54, 68)	VCR CAMERA
FLASH MODE	● ON	To fire the flash (optional) regardless of the brightness of the surroundings	CAMERA MEMORY
	ON 👁	To fire the flash (optional) before recording to reduce the red-eye phenomenon regardless of the brightness of the surroundings	
	AUTO	To fire the flash (optional) automatically	
	AUTO 👁	To fire the flash (optional) before recording to reduce the red-eye phenomenon	
FLASH LVL	HIGH	To make the flash (optional) level higher than normal	CAMERA MEMORY
	● NORMAL	To use the normal setting	
	LOW	To make the flash (optional) level lower than normal	
WHT BAL	——	To adjust the white balance (p. 48)	CAMERA MEMORY
AUTO SHTR	● ON	To automatically activate the electronic shutter* when shooting in bright conditions	CAMERA
	OFF	To not automatically activate the electronic shutter* even when shooting in bright conditions	

* The electronic shutter is the function used to adjust the shutter speed automatically.

Notes on FLASH MODE and FLASH LVL

- You cannot adjust FLASH MODE and FLASH LVL if the external flash (optional) is not compatible.
- The FLASH MODE details differ depending on the flash (optional) you use.

Icon/item	Mode	Meaning	POWER switch
CAMERA SET			
D ZOOM	● OFF	To deactivate the digital zoom. Up to 10× zoom is carried out.	CAMERA
	20×	To activate the digital zoom. More than 10× to 20× zoom is performed digitally (p. 32).	
	120×	To activate the digital zoom. More than 10× to 120× zoom is performed digitally.	
16:9WIDE	● OFF	To not record a 16:9 wide picture	CAMERA
	ON	To record a 16:9 wide picture (p. 49)	
STEADYSHOT	● ON	To compensate for camera-shake	CAMERA
	OFF	To cancel SteadyShot. Natural pictures are produced when shooting a stationary subject with a tripod.	
N.S. LIGHT	● ON	To use the NightShot Light (p. 34)	CAMERA MEMORY
	OFF	To cancel the NightShot Light	

Notes on SteadyShot

- SteadyShot will not correct excessive camera-shake.
- Attachment of a conversion lens (optional) may influence SteadyShot.

If you cancel SteadyShot

The (SteadyShot off) indicator appears. Your camcorder prevents excessive compensation for camera-shake.

(continued on the following page)

Icon/item	Mode	Meaning	POWER switch
VCR SET			
HiFi SOUND	● STEREO	To play back the stereo tape or dual sound track tape with main and sub sound (p. 190)	VCR
	1	To play back the stereo tape with the left sound or the dual sound track tape with main sound	
	2	To play back the stereo tape with the right sound or the dual sound track tape with sub sound	
AUDIO MIX	——	To adjust the balance between stereo 1 and stereo 2 (p. 93)	VCR
A/V → DV OUT	● OFF	To output digital images and sound in analog format using your camcorder	VCR
	ON	To output analog images and sound in digital format using your camcorder (p. 163)	
LCD/VF SET			
LCD B.L.	● BRT NORMAL	To set the brightness on the LCD screen normal	VCR CAMERA MEMORY
	BRIGHT	To brighten the LCD screen	
LCD COLOR	——	To adjust the color on the LCD screen with ↓/↑	VCR CAMERA MEMORY
VF B.L.	● BRT NORMAL	To set the brightness on the viewfinder screen to normal	VCR CAMERA MEMORY
	BRIGHT	To brighten the viewfinder screen	

Notes on LCD B.L. and VF B.L.

- When you select BRIGHT, battery life is reduced by about 10 percent during recording.
- When you use power sources other than the battery pack, BRIGHT is automatically selected.

Even if you adjust LCD B.L., LCD COLOR and VF B.L.

The recorded picture will not be affected.

Icon/item	Mode	Meaning	POWER switch
MEM SET 1			
STILL SET			
BURST	● OFF	Not to record continuously	(MEMORY)
	NORMAL	To record from 4 to 13 images continuously (p. 108)	
	EXP BRKTG	To record three images continuously with different exposure	
QUALITY	● FINE	To record still images in the fine image quality mode (p. 102)	(VCR) (MEMORY)
	STANDARD	To record still images in the standard image quality mode	
IMAGESIZE	● 1152 × 864	To record still images in 1152 × 864 size (p. 103)	(MEMORY)
	640 × 480	To record still images in 640 × 480 size	
MOVIE SET			
IMAGESIZE	● 320 × 240	To record moving pictures in 320 × 240 size (p. 104)	(VCR) (MEMORY)
	160 × 112	To record moving pictures in 160 × 112 size	
REMAIN	● AUTO	To display the remaining capacity of the "Memory Stick" in the following cases: • For five seconds after setting the POWER switch to VCR and inserting the "Memory Stick" • When the remaining capacity of the "Memory Stick" is less than two minutes after setting the POWER switch to MEMORY • For five seconds from the start of moving picture recording • For five seconds after completing moving picture recording	(VCR) (MEMORY)
	ON	To always display the remaining capacity of the "Memory Stick"	
NEW FOLDER	● ADD	To create a new folder (p. 123)	(MEMORY)
	RETURN	To cancel creating a new folder	
REC FOLDER	——	To choose a recording folder (p. 123)	(MEMORY)
FILE NO.	● SERIES	To assign file numbers in sequence even when the "Memory Stick" is changed However, the file numbering is reset if you create a new folder or change the recording folder.	(VCR) (MEMORY)
	RESET	To assign file numbers starting with 0001 to each "Memory Stick"	

When you select image quality

The number of images you can shoot in the currently selected image quality appears on the screen.

(continued on the following page)

Icon/item	Mode	Meaning	POWER switch
MEM SET 2			
SLIDE SHOW	RETURN	To cancel slide show	MEMORY
	● ALL FILES	To play back all the images on the "Memory Stick" executing slide show (p. 130)	
	FOLDER □□□*	To play back all the images in the playback folder you are selecting executing slide show	
INT. R -STL	ON	To activate Interval Photo Recording (p. 115)	MEMORY
	● OFF	To deactivate Interval Photo Recording	
	SET	To set INTERVAL for Interval Photo Recording	
DELETE ALL	● RETURN	To cancel deleting all the image	MEMORY
	ALL FILES	To delete all the unprotected images (p. 134)	
	FOLDER □□□*	To delete all the images in the playback folder you are selecting	
FORMAT	● RETURN	To cancel formatting	MEMORY
	OK	To format the inserted "Memory Stick" Formatting erases all information on the "Memory Stick." Check the contents of the "Memory Stick" before formatting. 1. Select FORMAT, then press EXEC. 2. Select OK, then press EXEC. 3. After the EXECUTE indicator appears, press EXEC. The FORMATTING indicator flashes during formatting. The COMPLETE indicator appears when formatting is complete.	

* The folder name is displayed in the □□□.

Notes on formatting

- Do not do any of the following while the FORMATTING indicator appears:
  – Turn the POWER switch to the other position
  – Operate buttons
  – Eject the "Memory Stick"
- The "Memory Stick" supplied with your camcorder has been formatted at factory. Formatting with your camcorder is not required.
- You cannot format the "Memory Stick" if the write-protect tab on the "Memory Stick" is set to LOCK.
- Format the "Memory Stick" if the "⚠ FORMAT ERROR" indicator appears.
- Formatting erases sample images on the "Memory Stick."
- Formatting erases protected image data on the "Memory Stick."
- Formatting erases newly created folders.

Icon/item	Mode	Meaning	POWER switch
CM SET			
TITLE	——	To superimpose a title or make your own title (p. 94, 96)	VCR CAMERA
TITLEERASE	——	To erase the title you have superimposed (p. 95)	VCR CAMERA
TITLE DSPL	● ON	To display the title you have superimposed	VCR
	OFF	To not display the title	
CM SEARCH	● ON	To search using Cassette Memory (p. 72, 73)	VCR
	OFF	To search without using Cassette Memory	
TAPE TITLE	——	To label the cassette (p. 97)	VCR CAMERA
ERASE ALL	● RETURN	To cancel erasing all	VCR CAMERA
	OK	To erase all the data in Cassette Memory (p. 98)	

(continued on the following page)

Icon/item	Mode	Meaning	POWER switch
TAPE SET			
REC MODE	● SP	To record in the SP (Standard Play) mode	VCR CAMERA
	LP	To increase the recording time to 1.5 times the SP mode	
AUDIO MODE	● 12BIT	To record in the 12-bit mode (two stereo sounds)	VCR CAMERA
	16BIT	To record in the 16-bit mode (the one stereo sound with high quality)	
REMAIN	● AUTO	To display the remaining tape: • For about eight seconds after setting the POWER switch to VCR or CAMERA and inserting a cassette, then your camcorder calculates the remaining amount of tape • For about eight seconds after setting the POWER switch to VCR and ►II is pressed	VCR CAMERA
	ON	To always display the remaining tape indicator	
FRAME REC	● OFF	To deactivate frame recording	CAMERA
	ON	To activate frame recording (p. 65)	
INT. REC	ON	To activate Interval Recording (p. 64)	CAMERA
	● OFF	To deactivate Interval Recording	
	SET	To set INTERVAL and REC TIME for Interval Recording	

Notes on the LP mode

- When you record the tape in the LP mode on your camcorder, we recommend playing back the tape on your camcorder. When you play back the tape on other camcorders or VCRs, noise may occur in pictures or sound.
- When you record in the LP mode, we recommend using a Sony Excellence/Master mini DV cassette so that you can get the most out of your camcorder.
- You cannot make audio dubbing on the tape recorded in the LP mode. Use the SP mode for the tape to be audio dubbed.
- When you record in the SP and LP modes on one tape or you record some scenes in the LP mode, the playback picture may be distorted or the time code may not be written properly between scenes.

Notes on AUDIO MODE

- You cannot dub audio sound on the tape recorded in the 16-bit mode.
- When playing back the tape recorded in the 16-bit mode, you cannot adjust the balance in AUDIO MIX.

Icon/item	Mode	Meaning	POWER switch
SETUP MENU			
CLOCK SET	——	To set the date or time (p. 21)	CAMERA, MEMORY
USB STREAM	● OFF	To deactivate the USB Streaming function	VCR, CAMERA
	ON	To activate the USB Streaming function	
LANGUAGE	● ENGLISH	To display the information indicators in English	VCR, CAMERA, MEMORY
	FRANÇAIS	To display the information indicators in French	
	ESPAÑOL	To display the information indicators in Spanish	
	PORTUGUÊS	To display the information indicators in Portuguese	
	中文	To display the information indicators in Chinese	
	한국어	To display the information indicators in Korean	
DEMO MODE	● ON	To make the demonstration appear	CAMERA
	OFF	To cancel the demonstration mode	

Notes on DEMO MODE

- You cannot select DEMO MODE when the cassette or the "Memory Stick" is inserted in your camcorder.
- When NIGHTSHOT is slid to ON, the "NIGHTSHOT" indicator appears on the screen and you cannot select DEMO MODE in the menu settings.
- If you press the touch panel during the demonstration, the demonstration stops for a while, then it starts again after about 10 minutes.
- DEMO MODE is set to STBY (Standby) at the default setting and the demonstration starts about 10 minutes after you have set the POWER switch to CAMERA without the cassette and the "Memory Stick" inserted.
  To cancel the demonstration, insert the cassette or "Memory Stick," set the POWER switch to the position other than CAMERA, or set DEMO MODE to OFF in the menu settings. To set to STBY (Standby) again, leave the DEMO MODE at ON in the menu settings, set the POWER switch OFF (CHG), then back to CAMERA.

(continued on the following page)

Icon/item	Mode	Meaning	POWER switch
ETC OTHERS			
DATA CODE (On the Remote Commander)	● DATE/CAM	To display date, time and various settings during playback when you press DATA CODE on the Remote Commander (p. 39)	(VCR) (MEMORY)
	DATE	To display date and time during playback when you press DATA CODE on the Remote Commander	
AREA SET	——	Temporarily change the area where you are using your camcorder	(CAMERA) (MEMORY)
DST SET*	● OFF	Not during daylight saving time	(CAMERA) (MEMORY)
	ON	During daylight saving time	
BEEP	● MELODY	To output the melody when you start/stop recording or when an unusual condition occurs on your camcorder	(VCR) (CAMERA) (MEMORY)
	NORMAL	To output the beep instead of the melody	
	OFF	To cancel melody, the beep sound and shutter sound	
COMMANDER	● ON	To activate the Remote Commander supplied with your camcorder	(VCR) (CAMERA) (MEMORY)
	OFF	To deactivate the Remote Commander to avoid remote control misoperation caused by other VCR's remote control	
DISPLAY	● LCD	To show the display on the LCD screen and viewfinder	(VCR) (CAMERA) (MEMORY)
	V-OUT/LCD	To show the display on the TV screen, LCD screen and viewfinder	

* Instead of DST, SUMMERTIME appears on the screen for some models.

Note

If you press DISPLAY/BATTERY INFO with DISPLAY set to V-OUT/LCD in the menu settings, the picture from a TV or VCR will not appear on the LCD screen even when your camcorder is connected to the output jacks on the TV or VCR.

Icon/item	Mode	Meaning	POWER switch
ETC OTHERS			
REC LAMP	● ON	To light up the camera recording lamp at the front of your camcorder	CAMERA MEMORY
	OFF	To turn the camera recording lamp off so that the person is not aware of the recording	
VIDEO EDIT	● RETURN	To cancel Digital program editing	VCR
	TAPE	To make programs and perform Digital program editing on the tape (p. 77)	
	MEMORY	To make programs and perform Digital program editing on the "Memory Stick" (p. 121)	

When recording a close subject

When REC LAMP is set to ON, the red camera recording lamp on the front of your camcorder may reflect on the subject if it is close. In this case, we recommend you set REC LAMP to OFF.

In more than five minutes after removing the power source

The PROGRAM AE, FLASH LVL, WHT BAL, HiFi SOUND, AUDIO MIX and COMMANDER items are returned to their default settings.
Other menu items are held in memory even when the power source is removed.

Types of trouble and how to correct trouble

If you run into any problem using your camcorder, use the following table to troubleshoot the problem. If the problem persists, disconnect the power source and contact your Sony dealer. If "C:□□:□□" appears on the screen, the self-diagnosis display function has activated. See page 186.

During recording

Symptom	Cause and/or Corrective Actions
START/STOP does not operate.	• The POWER switch is not set to CAMERA. → Set it to CAMERA (p. 26). • Your camcorder automatically turns off to prevent the battery pack from running out and to protect the tape when your camcorder has been during recording standby for more than five minutes. → Set the POWER switch to OFF (CHG) and then to CAMERA. • The tape has run out. → Rewind the tape or insert a new one (p. 8, 39). • The write-protect tab is set to expose the red mark. → Use a new cassette or slide the tab (p. 190). • The tape is stuck to the drum (moisture condensation). → Eject the cassette and leave your camcorder for at least one hour to acclimatize (p. 197).
The power goes off.	• Your camcorder automatically turns off to prevent the battery pack from running out and to protect the tape when your camcorder has been during recording standby for more than five minutes. → Set the POWER switch to OFF (CHG) and then to CAMERA. • The battery pack is dead or nearly dead. → Install a fully charged battery pack.
The picture in the viewfinder is not clear.	• The viewfinder lens is not adjusted. → Adjust the viewfinder lens (p. 31).
SteadyShot does not work.	• STEADYSHOT is set to OFF in the menu settings. → Set it to ON (p. 169).
The autofocusing function does not work.	• The setting is the manual focus. → Press FOCUS to set to the autofocus (p. 62). • Shooting conditions are not suitable for autofocus. → Adjust to focus manually (p. 62).
The picture does not appear in the viewfinder.	• The LCD panel is open. → Close the LCD panel (p. 29).
A vertical band appears when you shoot a subject such as lights or a candle flame against a dark background.	• The contrast between the subject and background is too high. This is not a malfunction.
A vertical band appears when you shoot a very bright subject.	• This is not a malfunction.
Some tiny spots in white, red, blue or green appear on the screen.	• SLOW SHTR, Super NightShot or Color Slow Shutter is activated. This is not a malfunction.

Types of trouble and how to correct trouble

Symptom	Cause and/or Corrective Actions
An unknown picture appears on the screen.	• If 10 minutes elapse after you set the POWER switch to CAMERA or DEMO MODE is set to ON in the menu settings without a cassette and the "Memory Stick" inserted, your camcorder automatically starts the demonstration. → Insert a cassette/the "Memory Stick" or press the LCD screen. The demonstration stops. You can also set DEMO MODE to OFF in the menu settings (p. 175).
The picture is recorded in incorrect or unnatural colors.	• NIGHTSHOT is slid to ON. → Slide it to OFF (p. 33).
Picture appears too bright, and the subject does not appear on the screen.	• NIGHTSHOT is slid to ON in a bright place. → Slide it to OFF (p. 33). • The back light function is active. → Set it off (p. 33).
The click of the shutter does not sound.	• BEEP is set to OFF in the menu settings. → Set it to MELODY or NORMAL (p. 176).
Black bands appear when you record a TV screen or computer screen.	→ Set STEADYSHOT to OFF in the menu settings (p. 169).
An external flash (optional) does not work.	• The power of the external flash (optional) is off or the power source is not installed. → Turn on the external flash (optional) or install the power source. • Two or more external flashes (optional) are attached. → Only one external flash (optional) can be attached.
Flickering or changes in color occurs.	• Phenomena that appear when recording in the PORTRAIT or SPORTS mode of PROGRAM AE in light from a discharge tube such as a fluorescent lamp, sodium lamp or mercury lamp are not due to a malfunction. → Set PROGRAM AE to AUTO in the menu settings.

(continued on the following page)

During playback

Symptom	Cause and/or Corrective Actions
Playback is not possible.	• The tape has run out. ➔ Rewind the tape (p. 39).
There are horizontal lines on the picture or the playback picture is not clear or does not appear.	• The video head may be dirty. ➔ Clean the head using the cleaning cassette (optional) (p. 198).
No sound or only a low sound is heard when playing back the tape.	• The stereo tape is played back with HiFi SOUND set to 2 in the menu settings. ➔ Set HiFi SOUND to STEREO (p. 170). • Volume is turned to minimum. ➔ Turn up the volume (p. 38). • AUDIO MIX is set to the ST2 side in the menu settings. ➔ Adjust AUDIO MIX (p. 170).
The sound breaks off.	• The video head may be dirty. ➔ Clean the head using the cleaning cassette (optional) (p. 198).
Displaying the record date, date search does not work.	• The cassette has no Cassette Memory. ➔ Use a cassette with Cassette Memory (p. 73). • CM SEARCH is set to OFF in the menu settings. ➔ Set it to ON (p. 173). • The tape has a blank portion in the recorded portion (p. 74).
Title search does not work.	• The cassette has no Cassette Memory. ➔ Use a cassette with Cassette Memory (p. 72). • CM SEARCH is set to OFF in the menu settings. ➔ Set it to ON (p. 173). • There is no title in the tape. ➔ Superimpose the titles (p. 94). • The tape has a blank portion in the recorded portion (p. 72).
New sound added to the recorded tape is not heard.	• AUDIO MIX is set to the ST1 side in the menu settings. ➔ Adjust AUDIO MIX (p. 170).
The title is not displayed.	• TITLE DSPL is set to OFF in the menu settings. ➔ Set it to ON (p. 173).
Noise appears on the screen followed by a PAL indicator.	• The TV color system of the recorded tape is different to the one of your camcorder.

During recording and playback

Symptom	Cause and/or Corrective Actions
The power does not turn on.	• The battery pack is not installed, or is dead or nearly dead. → Install a charged battery pack (p. 15, 16). • The AC Adaptor is not connected to a wall outlet. → Connect the AC Adaptor to a wall outlet (p. 20).
End search does not work.	• The cassette was ejected after recording when using a cassette without Cassette Memory (p. 36). • You have not recorded on the new cassette yet (p. 36).
End search does not work correctly.	• The tape has a blank portion in the beginning or middle (p. 36).
The battery pack is quickly discharged.	• The temperature of the environment is too low. • The battery pack is not fully charged. → Charge the battery pack fully again (p. 16). • The battery pack is completely dead, and cannot be recharged. → Replace with a new battery pack (p. 15).
The remaining battery time indicator does not indicate the correct time.	• You have used the battery pack in an extremely hot or cold environment for a long time. • The battery pack is completely dead, and cannot be recharged. → Replace with a new battery pack (p. 15). • The battery pack is not fully charged. → Install a fully charged battery pack (p. 15, 16). • A deviation has occurred in the remaining battery time. → Charge the battery pack fully again so that the indication on the remaining battery time indicator is correct (p. 16).
The power goes off although the remaining battery time indicator indicates that the battery pack has enough power to operate.	• A deviation has occurred in the remaining battery time. → Charge the battery pack fully again so that the indication on the remaining battery time indicator is correct (p. 16).
The cassette cannot be ejected from the compartment.	• The power source is disconnected. → Connect it firmly (p. 15, 20). • The battery pack is dead. → Use a charged battery pack (p. 15, 16).
The ⏏ and ⏏ indicators flash and no functions except for cassette ejection work.	• Moisture condensation has occurred. → Remove the cassette and leave your camcorder for at least one hour to acclimatize (p. 197).
The CM indicator does not appear when using the cassette with Cassette Memory.	• The gold-plated connector of the tape is dirty or dusty. → Clean the gold-plated connector (p. 191).
The remaining tape indicator is not displayed.	• REMAIN is set to AUTO in the menu settings. → Set it to ON to always display the remaining tape indicator (p. 174).

(continued on the following page)

When operating using the "Memory Stick"

Symptom	Cause and/or Corrective Actions
The "Memory Stick" does not function.	• The POWER switch is not set to MEMORY. → Set it to MEMORY (p. 106). • The "Memory Stick" is not inserted. → Insert the "Memory Stick" (p. 101).
Recording does not function.	• The "Memory Stick" has already been recorded to its full capacity. → Delete unnecessary images and record again (p. 132). • The "Memory Stick" formatted incorrectly is inserted. → Format the "Memory Stick" using your camcorder or use another "Memory Stick" (p. 101, 172). • The write-protect tab on the "Memory Stick" is set to LOCK. → Release the lock (p. 99). • You cannot record data in the 100MSDCF folder. It is only for playing back data.
The image cannot be deleted.	• The image is protected. → Cancel image protection (p. 131). • The write-protect tab on the "Memory Stick" is set to LOCK. → Release the lock (p. 99). • You try to delete images more than 100 images. → You can only choose the image to delete for up to 100 images at one time.
You cannot format the "Memory Stick."	• The write-protect tab on the "Memory Stick" is set to LOCK. → Release the lock (p. 99).
Deleting all the images cannot be carried out.	• The write-protect tab on the "Memory Stick" is set to LOCK. → Release the lock (p. 99).
You cannot protect the image.	• The write-protect tab on the "Memory Stick" is set to LOCK. → Release the lock (p. 99). • The index screen does not appear. → Press INDEX to display the index screen, then protect the image (p. 131).
You cannot write a print mark on the still image.	• The write-protect tab on the "Memory Stick" is set to LOCK. → Release the lock (p. 99). • The index screen does not appear. → Press INDEX to display the index screen, then write a print mark (p. 136). • You are trying to write a print mark on a moving picture. → Print marks cannot be written to a moving picture. • A print mark is written on 999 files. → A print mark can only be written on up to 999 files.

Types of trouble and how to correct trouble

Symptom	Cause and/or Corrective Actions
You cannot play back images in actual size.	• You may not be able to play back images in actual size when you try to play back images recorded by other equipment. This is not a malfunction.
You cannot play back image data.	• Your camcorder may not be able to play back some images processed with a computer or whose folder or file names have been changed with the computer. • If you record images with any other equipment, the images may not be played back normally on your camcorder.

(continued on the following page)

Others

Symptom	Cause and/or Corrective Actions
A title is not recorded.	• The cassette has no Cassette Memory. → Use the cassette with Cassette Memory (p. 94). • The Cassette Memory is full. → Erase unnecessary title (p. 95). • The cassette is set to prevent accidental erasure. → Slide the write-protect tab so that red portion is not visible (p. 190). • The tape has a blank portion in the recorded portion. → Superimpose the title to the recorded position (p. 94).
A cassette label is not recorded.	• The cassette has no Cassette Memory. → Use the cassette with Cassette Memory (p. 97). • The Cassette Memory is full. → Erase unwanted data (p. 95). • The tape is set to prevent accidental erasure. → Slide the write-protect tab so that red portion is not visible (p. 190).
Digital program editing to the tape does not function.	• The input selector on the VCR is not set correctly. → Set the selector correctly, then check the connection between the VCR and your camcorder (p. 78). • Your camcorder is connected to DV equipment of other than Sony using the i.LINK cable. → Set it to IR (p. 78). • Setting program on a blank portion of the tape is attempted. → Set the program again on a recorded portion (p. 83). • The synchronization of your camcorder and the VCR is not adjusted. → Adjust the synchronization of the VCR (p. 81). • The IR SETUP code is not correct. → Set the correct code (p. 80).
Digital program editing to the "Memory Stick" does not function.	• Setting program on a blank portion of the tape is attempted. → Set the program again on a recorded portion (p. 121).
The Remote Commander supplied with your camcorder does not work.	• COMMANDER is set to OFF in the menu settings. → Set it to ON (p. 176). • Something is blocking the infrared rays. → Remove the obstacle. • The batteries are inserted in the battery holder with the + – polarities incorrectly matching the + – marks. → Insert the batteries with the correct polarity (p. 210). • The batteries are dead. → Insert new ones (p. 210).
The picture from a TV or VCR does not appear even when your camcorder is connected to the outputs on the TV or VCR.	• DISPLAY is set to V-OUT/LCD in the menu settings. → Set it to LCD (p. 176).

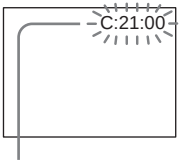
Types of trouble and how to correct trouble

Symptom	Cause and/or Corrective Actions
The melody or beep sounds for five seconds.	• Moisture condensation has occurred. → Eject the cassette and leave your camcorder for at least one hour to acclimatize (p. 197). • Some troubles have occurred in your camcorder. → Eject the cassette and insert it again, then operate your camcorder.
No function works though the power is on.	→ Disconnect the AC Adaptor from a wall outlet or remove the battery pack, then reconnect it in about one minute. Turn the power on. If the functions still do not work, press the RESET button using a sharp-pointed object. (If you press the RESET button, all the settings (DCR-TRV39: except the network settings) including the date and time return to the default) (p. 15, 20, 205).
When you set the POWER switch to VCR or OFF (CHG), if you move your camcorder, you may hear a clattering sound from inside your camcorder.	• This is because some functions use a linear mechanism. This is not a malfunction.
While charging the battery pack, no indicator appears.	• The battery pack is not properly installed. → Install it properly (p. 15).
You cannot charge the battery pack.	• The POWER switch is not set to OFF (CHG). → Set it to OFF (CHG) (p. 16).
The power runs out quickly, even though the remaining battery time indicator is full.	→ Charge the battery pack fully again (p. 16).
While charging the battery pack, the indicator flashes in the display window.	• The battery pack is not properly installed. → Install it properly (p. 15). • Something is wrong with the battery pack. → Please contact your Sony dealer or local authorized Sony service facility.
The buttons do not appear on the touch panel.	• DISPLAY/BATTERY INFO is pressed. → Press the LCD screen lightly. → Press DISPLAY/BATTERY INFO on your camcorder or DISPLAY on the Remote Commander (p. 39).
The buttons on the LCD screen do not work.	→ Adjust the screen (CALIBRATION) (p. 199).
Image data cannot be transferred to a computer by the USB connection.	• The USB cable was connected before installation of the USB driver was complete. → Uninstall the incorrect USB driver and reinstall the USB driver (p. 147). • USB STREAM is set to OFF in the menu settings. → Set it to ON (p. 175).
The cassette cannot be ejected even if the cassette lid is open.	• Moisture condensation has started to condense in your camcorder (p. 197).
The cassette cannot be ejected.	→ Remove the battery pack, then install it again (p. 15).

Self-diagnosis display

Your camcorder has a self-diagnosis display function.
This function displays the current condition of your camcorder as a 5-digit code (a combination of a letter and figures) on the LCD screen, viewfinder or display window. If a 5-digit code appears, check the following code chart. The last two digits (indicated by □□) will differ depending on the state of your camcorder.

LCD screen, Viewfinder or display window



Self-diagnosis display

- C:□□:□□
  You can service your camcorder yourself.
- E:□□:□□
  Contact your Sony dealer or local authorized Sony service facility.

5-digit display	Cause and/or Corrective Actions
C:04:□□	• You are using a battery pack that is not an "InfoLITHIUM" battery pack. → Use an "InfoLITHIUM" battery pack (p. 192).
C:21:□□	• Moisture condensation has occurred. → Eject the cassette and leave your camcorder for at least one hour to acclimatize (p. 197).
C:22:□□	• The video heads are dirty. → Clean the heads using the cleaning cassette (optional) (p. 198).
C:31:□□ C:32:□□	• A malfunction other than the above that you can service has occurred. → Eject the cassette and insert it again, then operate your camcorder. Do not perform this operation if moisture starts to condense (p. 197). → Disconnect the power cord of the AC Adaptor or remove the battery pack. After reconnecting the power source, operate your camcorder. → Replace the cassette.
E:20:□□ E:61:□□ E:62:□□	• A malfunction that you cannot service has occurred. → Contact your Sony dealer or local authorized Sony service facility and inform them of the 5-digit code. (e.g. E:61:10)

If you are unable to rectify the problem even if you try corrective actions a few times, contact your Sony dealer or local authorized Sony service facility.

Warning indicators

If indicators appear on the screen, check the following:
See the page in parentheses "( )" for details.

101-0001 **Warning indicator as to file**
Slow flashing:
- The file is corrupted.
- The file is unreadable.
- You are trying to carry out MEMORY MIX on moving pictures (p. 113).

C:21:00 **Self-diagnosis display** (p. 186)

The battery pack is dead or nearly dead
Slow flashing:
- The battery pack is nearly dead. Depending on operational, environmental or battery conditions the indicator may flash, even if there are approximately 5 to 10 minutes remaining.

Moisture condensation has occurred*
Fast flashing:
- Eject the cassette, set the POWER switch to OFF (CHG), and leave it for about one hour with the cassette lid open (p. 197).

Warning indicator as to Cassette Memory*
Slow flashing:
- No cassette with Cassette Memory is inserted (p. 189).

Warning indicator as to the "Memory Stick"
Slow flashing:
- No "Memory Stick" is inserted.

Fast flashing:
- The image cannot be recorded on the "Memory Stick."*

Warning indicator as to the "Memory Stick" formatting*
Fast flashing:
- The "Memory Stick" data is corrupted (p. 99).
- The "Memory Stick" is not formatted correctly (p. 172).

Warning indicator as to incompatible "Memory Stick"*
Slow flashing:
- An incompatible "Memory Stick" is inserted.

Warning indicator as to the tape
Slow flashing:
- The tape is near the end.
- No cassette is inserted.*
- The write-protect tab of the cassette is effective (red) (p. 190).*

Fast flashing:
- The tape has run out.*

You need to eject the cassette*
Slow flashing:
- The write-protect tab on the cassette is effective (red) (p. 190).

Fast flashing:
- Moisture condensation has occurred (p. 197).
- The tape has run out.
- The self-diagnosis display function is activated (p. 186).

The image is protected*
Slow flashing:
- The image is protected (p. 131).

Warning indicator as to the flash (optional)
Slow flashing:
- During charging

Fast flashing:
- The self-diagnosis display function is activated (p. 186).*
- There is something wrong with the external flash (optional).

Warning indicator as to still image recording
Slow flashing:
- The still image cannot be recorded on the "Memory Stick" (p. 46).

* You hear the melody or beep sound.

Warning messages

If messages appear on the screen, check the following. See the page in parentheses "( )" for details.

• CLOCK SET	Set the date and time (p. 21).
• FOR "InfoLITHIUM" BATTERY ONLY	Use an "InfoLITHIUM" battery pack (p. 192).
• CLEANING CASSETTE	The video heads are dirty (p. 198). The ⊗ indicator and "CLEANING CASSETTE" message appear one after another on the screen.
• COPY INHIBIT	You tried to record a picture that has a copyright control signal (p. 189).[1]
• FULL	The Cassette Memory is full.[1]
• 16BIT	AUDIO MODE is set to 16BIT.[1] You cannot dub new sound (p. 174).
• REC MODE	REC MODE is set to LP.[1] You cannot dub new sound onto a tape recorded on equipment of a different TV color system to that of your camcorder (p. 174).
• TAPE	There is no recorded portion on the tape.[1] You cannot dub new sound.
• "i.LINK" CABLE	i.LINK cable is connected.[1] You cannot dub new sound (p. 92).
• FULL	The "Memory Stick" is full (p. 109).[1]
•	The write-protect tab on the "Memory Stick" is set to LOCK (p. 99).[1]
• NO FILE	No image is recorded or recognized on the "Memory Stick."[1]
• NO MEMORY STICK	No "Memory Stick" is inserted.[1]
• AUDIO ERROR	You are trying to record an image with sound that cannot be recorded by your camcorder on the "Memory Stick" (p. 119).[1]
• MEMORY STICK ERROR	The "Memory Stick" data is corrupted (p. 101).[1]
• FORMAT ERROR	The "Memory Stick" is not recognized (p. 172).[1] Check the format.
• PLAY ERROR	The image is distorted and cannot be played back.[1][2]
• REC ERROR	Turn the POWER switch on again.[1]
• INCOMPATIBLE MEMORY STICK	The "Memory Stick" inserted is not compatible with your camcorder.[1]
• READ-ONLY MEMORY STICK	A read-only "Memory Stick" is inserted.[1]
• TAPE END	The tape has reached the end of the tape.[1]
• NO TAPE	Insert a cassette.[1]
• DELETING	You press PHOTO on your camcorder while deleting data in the "Memory Stick."[1]
• FORMATTING	You press PHOTO on your camcorder while formatting the "Memory Stick."[1]
• FOLDER NO. FULL	You have reached the maximum number of folders that can be created.[1]
• USB STREAMING ON GOING	You are using USB Streaming function.
• NOW CHARGING	Charging an external flash (optional) does not work correctly.[1]

[1] You hear the melody or beep sound.
[2] Reinsert the "Memory Stick" and play back.

DCR-TRV39 only

Refer to the Network Function/Application Operating Instruction supplied with your camcorder about warning messages in the network function.

Usable cassettes

Selecting cassette types

You can use the mini DV Mini DV cassette only.* You cannot use any other 8 mm 8, Hi8 Hi8, Digital8 D8, VHS VHS, VHSC VHSC, S-VHS S-VHS, S-VHSC S-VHSC, Betamax Beta, ED Betamax ED Beta, DV DV or MICROMV MICROMV cassette.

* There are two types of mini DV cassettes: with Cassette Memory and without Cassette Memory.
Cassettes with Cassette Memory have CM (Cassette Memory) mark.
We recommend that you use cassettes with Cassette Memory.

IC memory is mounted on this type of cassette. Your camcorder can read and write data such as dates of recording or titles, etc. to this memory.
The functions using the Cassette Memory require successive signals recorded on the tape. If the tape has a blank portion at the beginning or between recorded portions, titles may not be displayed properly or the search functions may not work properly. Perform the following to prevent a blank portion from being made on the tape.
Press END SCH to go to the end of the recorded portion before you begin the next recording if you operate the following:
– You have ejected the cassette during recording.
– You have played back the tape.
– You have used edit search.

If there is a blank portion or discontinuous signal on the tape, re-record from the beginning to the end of the tape as described above.
The same result may occur when you record using a digital video camera recorder without Cassette Memory on the tape recorded by one with the Cassette Memory.

CM 4K mark on the cassette

The memory capacity of the tape marked with CM 4K is 4K bits. Your camcorder can accommodate up to 16K bits. 16K bits tape is marked with CM 16K.

Mini DV Digital Video Cassette This is the Mini DV mark.

CM Cassette Memory This is the Cassette Memory mark.

These are trademarks.

Copyright signal

When you play back

If the tape you play back on your camcorder contains copyright signals, you cannot copy it with another video camera connected to your camcorder.

When you record

You cannot record software on your camcorder that contains copyright control signals for copyright protection of software.

The COPY INHIBIT indicator appears on the screen, or on the TV screen if you try to record such software. Your camcorder does not record copyright control signals on the tape when it records.

Audio mode

12-bit mode: The original sound can be recorded in stereo 1, and the new sound in stereo 2 in 32 kHz. The balance between stereo 1 and stereo 2 can be adjusted by selecting AUDIO MIX in the menu settings during playback. Both sounds can be played back.

16-bit mode: A new sound cannot be recorded but the original sound can be recorded in high quality. Moreover, it can also play back sound recorded in 32 kHz, 44.1 kHz or 48 kHz. When playing back the tape recorded in the 16-bit mode, the 16BIT indicator appears on the screen.

When you play back the dual sound track tape

When you play back the dual sound track tape recorded in a stereo system, set HiFi SOUND in to a desired mode in the menu settings (p. 170).

Sound from speaker

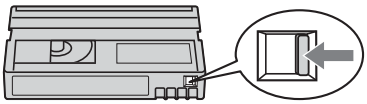
HiFi Sound Mode	Playing back the stereo tape	Playing back the dual sound track tape
STEREO	Stereo	Main sound and sub sound
1	Lch	Main sound
2	Rch	Sub sound

You cannot record dual sound programs on your camcorder.

Notes on the cassette

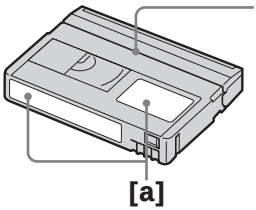
To prevent accidental erasure

Slide the write-protect tab on the cassette to expose the red mark.



When affixing a label on the cassette

Be sure to affix a label only on the locations as illustrated below **[a]** so as not to cause malfunction of your camcorder.



After using the cassette

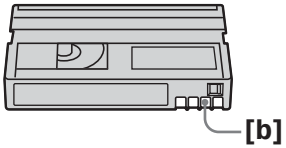
Rewind the tape to the beginning, put the cassette in its case, and store it in an upright position.

When the Cassette Memory function does not work

Reinsert a cassette. The gold-plated connector of mini DV cassettes may be dirty or dusty.

Cleaning gold-plated connector

If the gold-plated connector on the cassette is dirty or dusty, the remaining tape indicator sometimes does not appear correctly, and you may not be able to operate functions using Cassette Memory.
Clean up the gold-plated connector with a cotton-wool swab, about every 10 times ejection of a cassette. **[b]**



About the “InfoLITHIUM” battery pack

This unit is compatible with the “InfoLITHIUM” battery pack (M series). Your camcorder operates only with the “InfoLITHIUM” battery pack. “InfoLITHIUM” M series battery packs have the InfoLITHIUM M SERIES mark.

What is the “InfoLITHIUM” battery pack?

The “InfoLITHIUM” battery pack is a lithium-ion battery pack that has functions for communicating information related to operating conditions between your camcorder and an optional AC adaptor/charger.
The “InfoLITHIUM” battery pack calculates the power consumption according to the operating conditions of your camcorder, and displays the remaining battery time in minutes. With an AC adaptor/charger (optional), the remaining battery time and charging time appear.

Charging the battery pack

- Be sure to charge the battery pack before you start using your camcorder.
- We recommend charging the battery pack in an ambient temperature of between 10°C to 30°C (50°F to 86°F) until the FULL indicator appears in the display window, indicating that the battery pack is fully charged. If you charge the battery outside of this temperature range, you may not be able to efficiently charge the battery pack.
- After charging is complete, either disconnect the cable from the DC IN jack on your camcorder or remove the battery pack.

Effective use of the battery pack

- Battery pack performance decreases in 10°C (50°F) or below surroundings. So, the time that the battery pack can be used becomes shorter. We recommend the following to use the battery pack longer:
  – Put the battery pack in a pocket to warm it up, and insert it in your camcorder immediately before you start taking shots.
  – Use the large capacity battery pack (NP-FM50/FM70/QM71/QM71D/FM91/QM91/QM91D, optional).
- Frequently using the LCD screen or frequently operating playback, fast forward or rewind wears out the battery pack faster. We recommend using the large capacity battery pack (NP-FM50/FM70/QM71/QM71D/FM91/QM91/QM91D, optional).
- Be certain to set the POWER switch to OFF (CHG) when not taking shots or playing back on your camcorder. The battery pack is also consumed when your camcorder is during tape recording standby or playback pause.
- Have spare battery packs handy for two or three times the expected recording time, and make trial recordings before taking the actual recording.
- Do not expose the battery pack to water. The battery pack is not water resistant.

Remaining battery time indicator

- If the power goes off although the remaining battery time indicator indicates that the battery pack has enough power to operate, charge the battery pack fully again so that the indication on the remaining battery time indicator is correct. Note, however, that the correct battery indication sometimes will not be restored if it is used in high temperatures for a long time or left in a fully charged state, or the battery pack is frequently used. Regard the remaining battery time indication as the approximate shooting time.
- The mark indicating little remaining battery time sometimes flashes depending on the operating conditions or ambient temperature and environment even if the remaining battery time is about 5 to 10 minutes.

How to store the battery pack

- If the battery pack is not used for a long time, do the following procedure once per year to maintain proper function.
  1. Fully charge the battery pack.
  2. Discharge on your electronic equipment.
  3. Remove the battery pack from the equipment and store it in a dry, cool place.
- To use the battery pack up on your camcorder, leave your camcorder during tape recording standby until the power goes off without a cassette inserted.

Battery life

- The battery life is limited. Battery capacity drops little by little as you use it more and more, and as time passes. When the available battery time is shortened considerably, a probable cause is that the battery pack has reached the end of its life. Please buy a new battery pack.
- The battery life varies depending on how it is stored and operating conditions and environment for each battery pack.

“InfoLITHIUM” is a trademark of Sony Corporation.

About i.LINK

The DV Interface on this unit is an i.LINK-compliant DV Interface. This section describes the i.LINK standard and its features.

What is i.LINK?

i.LINK is a digital serial interface for handling digital video, digital audio and other data in two directions between equipment having the i.LINK, and for controlling other equipment.
i.LINK-compatible equipment can be connected by a single i.LINK cable. Possible applications are operations and data transactions with various digital AV equipment.
When two or more i.LINK-compatible equipment are connected to this unit in a daisy chain, operations and data transactions are possible with not only the equipment that this unit is connected to but also with other devices via the directly connected equipment.
Note, however, that the method of operation sometimes varies according to the characteristics and specifications of the equipment to be connected, and that operations and data transactions are sometimes not possible on some connected equipment.

Note

Normally, only one piece of equipment can be connected to this unit by the i.LINK cable. When connecting this unit to i.LINK-compatible equipment having two or more DV Interfaces, refer to the operating instructions of the equipment to be connected.

About the name "i.LINK"

i.LINK is a more familiar term for IEEE 1394 data transport bus proposed by Sony, and is a trademark approved by many corporations.
IEEE 1394 is an international standard standardized by the Institute of Electrical and Electronics Engineers.

i.LINK baud rate

i.LINK's maximum baud rate varies according to the equipment. Three maximum baud rates are defined:

S100 (approx. 100Mbps*)
S200 (approx. 200Mbps)
S400 (approx. 400Mbps)

The baud rate is listed under "Specifications" in the operating instructions of each equipment. It is also indicated near the i.LINK on some equipment.
The maximum baud rate of equipment on which it is not indicated such as this unit is "S100."
When units are connected to equipment having a different maximum baud rate, the baud rate sometimes differs from the indicated baud rate.

*What is Mbps?

Mbps stands for megabits per second, or the amount of data that can be sent or received in one second. For example, a baud rate of 100Mbps means that 100 megabits of data can be sent in one second.

i.LINK functions on this unit

For details on how to dub when this unit is connected to other video equipment having DV Interface, see page 75 and 86.
This unit can also be connected to other i.LINK (DV Interface) compatible equipment made by Sony (e.g. VAIO series personal computer) other than video equipment.
Before connecting this unit to a computer, make sure that application software supported by this unit is already installed on a computer.
Even if a video device such as a digital TV, DVD or MICROMV has an i.LINK, it may not support digital video. Confirm digital video compatibility before connecting.
For details on precautions when connecting this unit, also refer to the operating instructions for the equipment to be connected.

Required i.LINK cable

Use the Sony i.LINK 4-pin-to-4-pin cable (during DV dubbing).

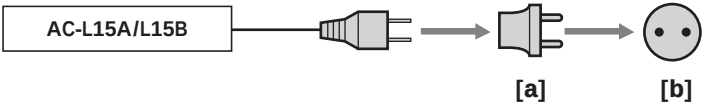
i.LINK and i, are trademarks.

Using your camcorder abroad

Using your camcorder abroad

You can use your camcorder in any country or area with the AC Adaptor supplied with your camcorder within 100 V to 240 V AC, 50/60 Hz.

Use a commercially available AC plug adaptor **[a]**, if necessary, depending on the design of the wall outlet **[b]**.



Your camcorder is an NTSC system-based camcorder. If you want to view the playback picture on a TV, it must be an NTSC system-based TV with the AUDIO/VIDEO input jack.
The following shows TV color systems used overseas.

NTSC system
Bahama Islands, Bolivia, Canada, Central America, Chile, Colombia, Ecuador, Guyana, Jamaica, Japan, Korea, Mexico, Peru, Surinam, Taiwan, the Philippines, the U.S.A., Venezuela, etc.

PAL system
Australia, Austria, Belgium, China, Czech Republic, Denmark, Finland, Germany, Holland, Hong Kong, Hungary, Italy, Kuwait, Malaysia, New Zealand, Norway, Poland, Portugal, Singapore, Slovak Republic, Spain, Sweden, Switzerland, Thailand, United Kingdom etc.

PAL-M system
Brazil

PAL-N system
Argentina, Paraguay, Uruguay

SECAM system
Bulgaria, France, Guiana, Iran, Iraq, Monaco, Russia, Ukraine, etc.

Moisture condensation

If your camcorder is brought directly from a cold place to a warm place, moisture may condense inside your camcorder, on the surface of the tape, or on the lens. In this condition, the tape may stick to the head drum and be damaged or your camcorder may not operate correctly. If there is moisture inside your camcorder, the beep sounds and the ⚿ indicator flashes. When the ⏏ indicator flashes at the same time, the cassette is inserted in your camcorder. If moisture condenses on the lens, the indicator will not appear.

If moisture condensation has occurred

None of the functions except cassette ejection will work. Eject the cassette, turn off your camcorder, and leave it for about one hour with the cassette lid open. Your camcorder can be used again if the ⚿ or ⏏ indicator does not appear when the power is turned on again.

If moisture starts to condense, your camcorder sometimes cannot detect condensation. If this happens, the cassette is sometimes not ejected for 10 seconds after the cassette lid is opened. This is not a malfunction. Do not close the cassette lid until the cassette is ejected.

Note on moisture condensation

Moisture may condense when you bring your camcorder from a cold place into a warm place (or vice versa) or when you use your camcorder in a hot place as follows:

– You bring your camcorder from a ski slope into a place warmed up by a heating device.
– You bring your camcorder from an air-conditioned car or room into a hot place outside.
– You use your camcorder after a squall or a shower.
– You use your camcorder in a high temperature and humidity place.

How to prevent moisture condensation

When you bring your camcorder from a cold place into a warm place, put your camcorder in a plastic bag and tightly seal it. Remove the bag when the air temperature inside the plastic bag has reached the surrounding temperature (after about one hour).

Maintenance information

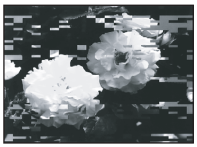
Cleaning the video head

To ensure normal recording, clear pictures and sound, clean the video head. The video head may be dirty when:

– Mosaic-pattern noise appears on the playback picture.
– Playback pictures do not move.
– Playback pictures do not appear or the sound breaks off.
– The ⊗ indicator and "CLEANING CASSETTE" message appear one after another or the ⊗ indicator flashes on the screen during recording.

If the above problem, **[a]**, **[b]** or **[c]** occurs, clean the video heads for 10 seconds with the Sony DVM-12CLD cleaning cassette (optional). Check the picture and if the above problem persists, repeat cleaning.

[a]



[b]

[c]

If the video heads get dirtier, the entire screen becomes blue **[c]**.

Note on the video head

The video head suffers from wear after long use. If you cannot obtain a clear image even after using a cleaning cassette, it might be because the video head is worn. Please contact your Sony dealer or local authorized Sony service facility to have the video head replaced.

Cleaning the LCD screen

If fingerprints or dust make the LCD screen dirty, we recommend using a cleaning cloth (supplied) to clean the LCD screen. When you use the LCD Cleaning Kit (optional), do not apply the cleaning liquid directly to the LCD screen. Clean the LCD screen with cleaning paper moistened with the liquid.

Charging the built-in rechargeable battery

Your camcorder has a built-in rechargeable battery so that the date, time and other settings are retained even when the POWER switch is set to OFF (CHG). The built-in rechargeable battery is always charged as long as you are using your camcorder. The battery, however, will get discharged gradually if you do not use your camcorder. It will be completely discharged in **about three months** if you do not use your camcorder at all. Even if the built-in rechargeable battery is not charged, it will not affect your camcorder operation. To retain the date and time, etc., charge the battery if the battery is discharged.

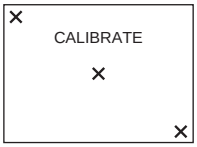
Charging the built-in rechargeable battery

- Connect your camcorder to the house current using the AC Adaptor supplied with your camcorder, and leave your camcorder with the POWER switch set to OFF (CHG) for more than 24 hours.
- Or install the fully charged rechargeable battery pack on your camcorder, and leave your camcorder with the POWER switch set to OFF (CHG) for more than 24 hours.

Adjusting the LCD screen (CALIBRATION)

The buttons on the touch panel may not work correctly. If this happens, follow the procedure below.

(1) Set the POWER switch to OFF (CHG).
(2) Eject the tape from your camcorder, then disconnect any connecting cable from your camcorder.
(3) Set the POWER switch to VCR while pressing DISPLAY/BATTERY INFO on your camcorder, then keep pressing DISPLAY/BATTERY INFO for about five seconds.
(4) Touch ✕ displayed on the screen with your finger or the supplied stylus (DCR-TRV39 only).
The position of ✕ changes.



Notes

- If you do not press the right spot, start from step 4 again.
- You cannot calibrate the LCD screen when you close the LCD panel with the LCD screen facing out.

Precautions

Camcorder operation

- Operate your camcorder on 7.2 V (battery pack) or 8.4 V (AC Adaptor).
- For DC or AC operation, use the accessories recommended in this operating instructions.
- If any solid object or liquid get inside the casing, unplug your camcorder and have it checked by a Sony dealer before operating it any further.
- Avoid rough handling or mechanical shock. Be particularly careful of the lens.
- Keep the POWER switch setting to OFF (CHG) when you are not using your camcorder.
- Do not wrap your camcorder with a towel, for example, and operate it. Doing so might cause heat to build up inside.
- Keep your camcorder away from strong magnetic fields or mechanical vibration.
- Do not press the LCD screen with a sharp objects other than the supplied stylus. (DCR-TRV39 only)
- If your camcorder is used in a cold place, a residual image may appear on the LCD screen. This is not a malfunction.
- While using your camcorder, the back of the LCD screen may heat up. This is not a malfunction.

On handling the tape

- Do not insert anything into the small holes on the rear of the cassette. These holes are used to sense the type and thickness of the tape and if the recording tab is in or out.
- Do not open the tape protect cover or touch the tape.
- Avoid touching or damaging the terminals. To remove dust, clean the terminals with a soft cloth.

Camcorder care

- Eject the tape, and periodically turn on the power, operate the CAMERA and VCR sections and play back the tape for about three minutes when your camcorder is not to be used for a long time.
- Clean the lens with a soft brush to remove dust. If there are fingerprints on the lens, remove them with a soft cloth.
- Clean your camcorder body with a dry soft cloth, or a soft cloth lightly moistened with a mild detergent solution. Do not use any type of solvent which may damage the finish.
- Do not let sand get into your camcorder. When you use your camcorder on a sandy beach or in a dusty place, protect it from the sand or dust. Sand or dust may cause your camcorder to malfunction, and sometimes this malfunction cannot be repaired.

AC Adaptor

- Unplug the unit from a wall outlet when you are not using the unit for a long time. To disconnect the power cord, pull it out by the plug. Never pull the power cord itself.
- Do not operate the unit with a damaged cord or if the unit has been dropped or damaged.
- Do not bend the power cord forcibly, or place a heavy object on it. This will damage the cord and may cause fire or electrical shock.
- Prevent metallic objects from coming into contact with the metal parts of the connecting section. If this happens, a short may occur and the unit may be damaged.
- Always keep metal contacts clean.
- Do not disassemble the unit.
- Do not apply mechanical shock or drop the unit.
- While the unit is in use, particularly during charging, keep it away from AM receivers and video equipment because it will disturb AM reception and video operation.
- The unit becomes warm during use. This is not a malfunction.
- Do not place the unit in locations that are:
  – Extremely hot or cold
  – Dusty or dirty
  – Very humid
  – Vibrating

About care and storage of the lens

- Wipe the surface of the lens clean with a soft cloth in the following instance:
  – When there are fingerprints on the lens surface
  – In hot or humid locations
  – When the lens is used in environments such as the seaside
- Store the lens in a well-ventilated location subject to little dirt or dust.

To prevent mold from occurring, periodically perform the above.
We recommend turning on and operating your camcorder about once per month to keep your camcorder in an optimum state for a long time.

Rechargeable battery pack

- Use only the specified charger or video equipment with the charging function.
- To prevent an accident from a short circuit, do not allow metal objects to come into contact with the battery terminals.
- Keep the rechargeable battery pack away from fire.
- Never expose the rechargeable battery pack to temperatures above 60°C (140°F), such as in a car parked in the sun or under direct sunlight.
- Store the rechargeable battery pack in a cool, dry place.
- Do not expose the rechargeable battery pack to any mechanical shock.
- Do not disassemble nor modify the rechargeable battery pack.
- Install the rechargeable battery pack to the video equipment securely.
- Charging while some capacity remains does not affect the original battery capacity.

Note on dry batteries

To avoid possible damage from battery leakage or corrosion, observe the following:
– Be sure to insert the batteries with the + – polarities matched to the + – marks.
– Dry batteries are not rechargeable.
– Do not use a combination of new and old batteries.
– Do not use different types of batteries.
– Current flows from batteries when you are not using them for a long time.
– Do not use leaking batteries.

If batteries are leaking

- Wipe off the liquid in the battery compartment carefully before replacing the batteries.
- If you touch the liquid, wash it off with water.
- If the liquid get into your eyes, wash your eyes with a lot of water and then consult a doctor.

If any problem occurs, unplug your camcorder and contact your nearest Sony dealer.

Specifications

Video camera recorder

System

Video recording system
2 rotary heads
Helical scanning system
Audio recording system
Rotary heads, PCM system
Quantization: 12 bits (Fs 32 kHz, stereo 1, stereo 2), 16 bits (Fs 48 kHz, stereo)
Video signal
NTSC color, EIA standards
Usable cassette
Mini DV cassette with the Mini DV mark printed
Tape speed
SP: Approx. 18.81 mm/s
LP: Approx. 12.56 mm/s
Recording/playback time (using cassette DVM60)
SP: 1 hour
LP: 1.5 hours
Fastforward/rewind time (using cassette DVM60)
Approx. 2 min. and 40 seconds
Viewfinder
Electric viewfinder (color)
Image device
3.8 mm (1/4.7 type) CCD (Charge Coupled Device)
Gross: Approx. 1 070 000 pixels
Effective (still):
Approx. 1 000 000 pixels
Effective (moving):
Approx. 690 000 pixels
Lens
Carl Zeiss Vario-Sonnar
Combined power zoom lens
Filter diameter: 30 mm (1 3/16 in)
10× (Optical), 120× (Digital)
F = 1.8 – 2.0
Focal length
3.7 – 37 mm (5/32 – 1 1/2 in.)
When converted to a 35 mm still camera
In CAMERA:
50 – 500 mm (2 – 19 3/4 in.)
In MEMORY:
42 – 420 mm (1 11/16 – 16 5/8 in.)
Color temperature
Auto, HOLD, INDOOR (3 200 K), OUTDOOR (5 800 K)
Minimum illumination
7 lx (lux) (F 1.8)
0 lx (lux) (in NightShot)*
* Objects unable to be seen due to the dark can be shot with infrared lighting.

Input/Output connectors

S video input/output
4-pin mini DIN
Luminance signal: 1 Vp-p, 75 Ω (ohms), unbalanced
Chrominance signal: 0.286 Vp-p, 75 Ω (ohms), unbalanced
Audio/Video input/output
AV MINI JACK, 1 Vp-p, 75 Ω (ohms), unbalanced
327 mV, (at output impedance more than 47 kΩ (kilohms))
Output impedance with less than 2.2 kΩ (kilohms)/Stereo minijack (ø 3.5 mm)
Input impedance more than 47 kΩ (kilohms)
DV input/output
4-pin connector
Headphone jack
Stereo minijack (ø 3.5 mm)
LANC jack
Stereo mini-minijack (ø 2.5 mm)
USB jack
DCR-TRV38:
mini-B
DCR-TRV39:
mini-AB
MIC jack
Minijack, 0.388 mV low impedance with 2.5 to 3.0 V DC, output impedance 6.8 kΩ (kilohms)
(ø 3.5 mm)
Stereo type

LCD screen

Picture
8.8 cm (3.5 type)
Total dot number
184 000 (840 × 220)

General

Power requirements
7.2 V (battery pack)
8.4 V (AC Adaptor)
Average power consumption (when using the battery pack)
During camera recording using LCD
DCR-TRV38: 4.3 W
DCR-TRV39: 4.4 W
Viewfinder
DCR-TRV38: 3.2 W
DCR-TRV39: 3.3 W
Operating temperature
0°C to 40°C (32°F to 104°F)
Storage temperature
–20°C to + 60°C
(–4°F to + 140°F)
Dimensions (approx.)
72 × 91 × 161 mm
(2 7/8 × 3 5/8 × 6 3/8 in.) (w/h/d)
Mass (approx.)
660 g (1 lb 7 oz)
main unit only
750 g (1 lb 10 oz)
including the rechargeable battery pack NP-FM30, cassette DVM60 and lens cap
Supplied accessories
See page 14.

AC Adaptor AC-L15A/L15B

Power requirements
100 – 240 V AC, 50/60 Hz
Current consumption
0.35 – 0.18 A
Power consumption
18 W
Output voltage
DC OUT: 8.4 V, 1.5 A
Operating temperature
0°C to 40°C (32°F to 104°F)
Storage temperature
–20°C to + 60°C
(–4°F to + 140°F)
Dimensions (approx.)
56 × 31 × 100 mm
(2 1/4 × 1 1/4 × 4 in.) (w/h/d)
excluding projecting parts
Mass (approx.)
190 g (6.7 oz)
excluding power cord

Rechargeable battery pack NP-FM30

Maximum output voltage
DC 8.4 V
Output voltage
DC 7.2 V
Capacity
5.0 Wh (700 mAh)
Dimensions (approx.)
38.2 × 20.5 × 55.6 mm
(1 9/16 × 13/16 × 2 1/4 in.)
(w/h/d)
Mass (approx.)
65 g (2.3 oz)
Type
Lithium ion

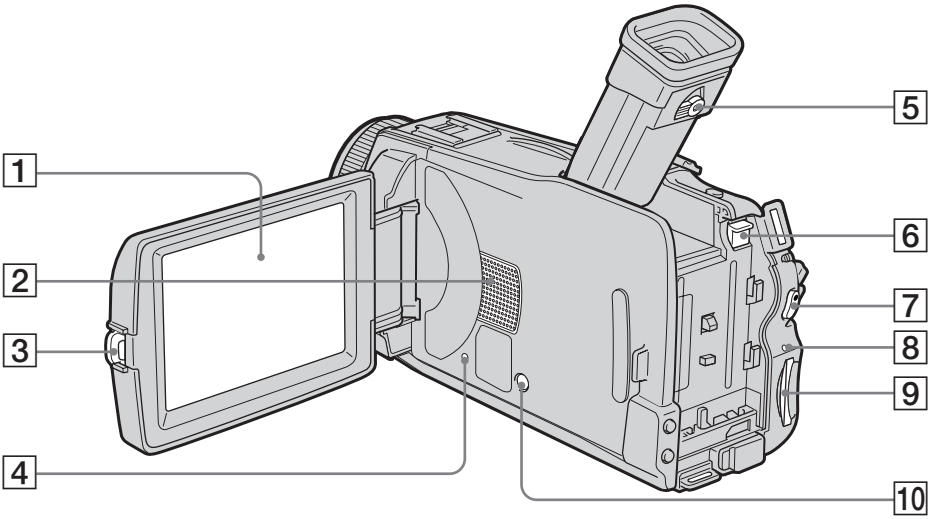
"Memory Stick"

Memory
Flash memory
8MB: MSA-8A
Operating voltage
2.7 – 3.6 V
Power consumption
Approx. 45 mA during operation mode
Approx. 130 µA during tape recording standby
Dimensions (approx.)
50 × 2.8 × 21.5 mm
(2 × 1/8 × 7/8 in.) (w/h/d)
Mass (approx.)
4 g (0.14 oz)

Design and specifications are subject to change without notice.

Identifying parts and controls

Camcorder



1 **LCD/Touch panel screen** (p. 24, 29, 30)

2 **Speaker**

3 **OPEN button** (p. 26)

4 **RESET button**
If you press RESET, all the settings (DCR-TRV39: except the network settings) including the date and time return to the default.

5 **Viewfinder lens adjustment lever** (p. 31)

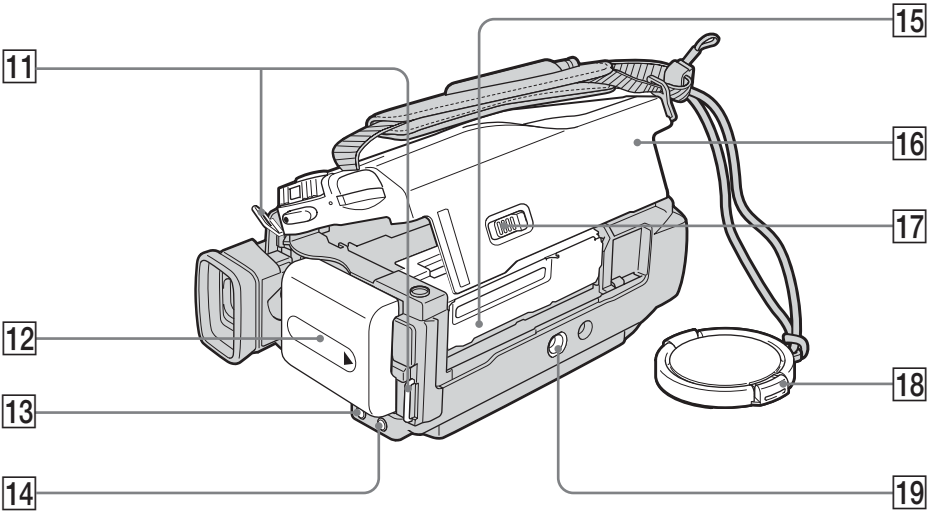
6 **BATT release button** (p. 15)

7 **START/STOP button** (p. 26)

8 **Access lamp**

9 **"Memory Stick" slot** (p. 101)

10 **DISPLAY/BATTERY INFO button** (p. 19, 39)



11 **Hooks for shoulder strap**

12 **Battery pack** (p. 15)

13 **FOCUS button** (p. 62)

14 **BACK LIGHT button** (p. 33)

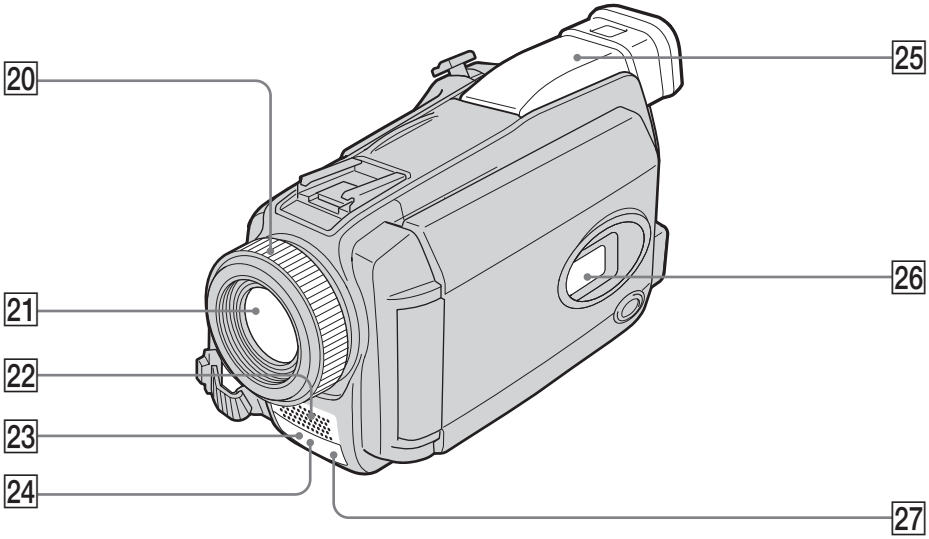
15 **Cassette compartment**

16 **Cassette lid** (p. 8)

17 **OPEN/EJECT lever** (p. 8)

18 **Lens cap** (p. 26)

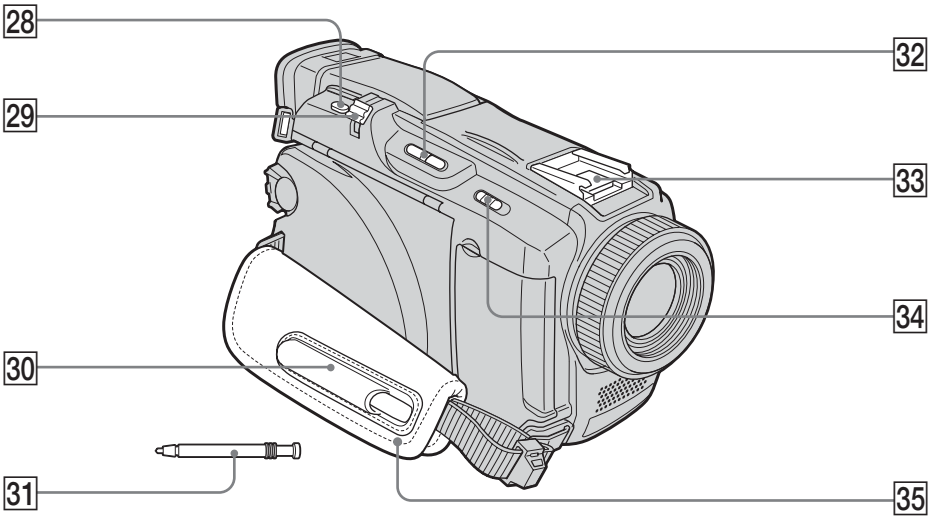
19 **Tripod receptacle**
Make sure that the length of the tripod screw is less than 5.5 mm (7/32 inch). Otherwise, you cannot attach the tripod securely, and the screw may damage your camcorder.



20 **Focus ring** (p. 62)
21 **Lens**
22 **Microphone**
23 **Infrared rays emitter** (p. 33, 79)
24 **Camera recording lamp** (p. 26)
25 **Viewfinder** (p. 31)
26 **Display window** (p. 16)
27 **Remote sensor**

Note on the Carl Zeiss lens
Your camcorder is equipped with a Carl Zeiss lens which can reproduce fine images. The lens for your camcorder was developed jointly by Carl Zeiss, in Germany, and Sony Corporation. It adopts the MTF* measurement system for video camera and offers a quality as the Carl Zeiss lens.

* MTF Stands for Modulation Transfer Function.
The value number indicates the amount of light of a subject coming into the lens.



28 **PHOTO button** (p. 45, 106, 110)

29 **Power zoom lever** (p. 32, 70, 129)

30 **Stylus holder** (DCR-TRV39 only) (p. 166)

31 **Stylus** (DCR-TRV39 only) (p. 166)

32 **EDITSEARCH button** (p. 36)

33 **Intelligent accessory shoe** (p. 91)

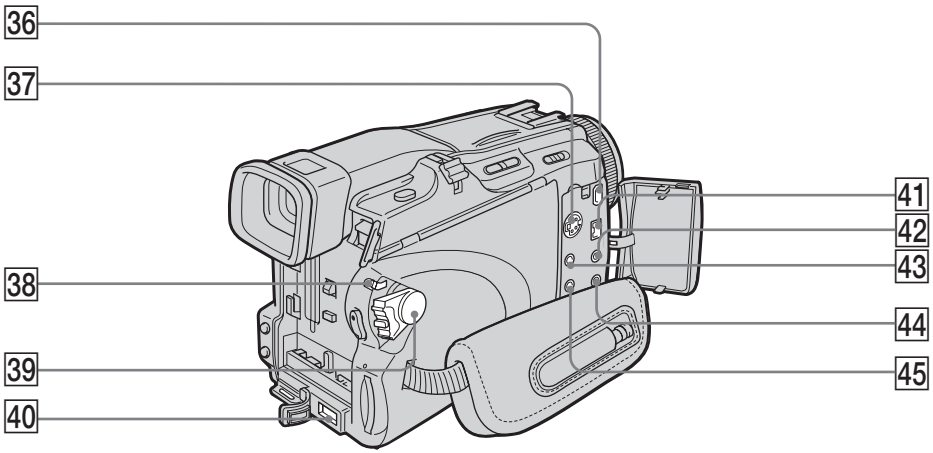
34 **NIGHTSHOT switch** (p. 33)

35 **Grip belt**

Intelligent Accessory Shoe

Notes on the intelligent accessory shoe

- The intelligent accessory shoe supplies power to optional accessories such as a video light or microphone.
- The intelligent accessory shoe is linked to the POWER switch, allowing you to turn the power supplied by the shoe on and off. Refer to the operating instructions of the accessory for details.
- The intelligent accessory shoe has a safety device for fixing the installed accessory securely. To connect an accessory, press down and push it to the end, and then tighten the screw.
- To remove an accessory, loosen the screw, and then press down and pull out the accessory.



36 **(USB) jack** (p. 137)

37 **S VIDEO jack** (p. 43)

38 **LOCK switch** (p. 27)

39 **POWER switch** (p. 26)

40 **DC IN jack** (p. 16)

41 **DV Interface** (p. 75, 86, 163)
The DV Interface is i.LINK compatible.

42 **(LANC) jack (blue)**

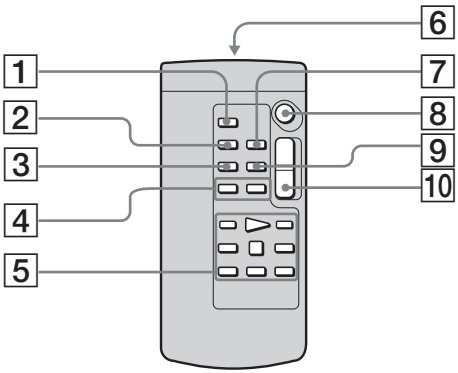
43 **AUDIO/VIDEO jack** (p. 43, 75, 86, 163)

44 **MIC (PLUG IN POWER) jack (red)**
Connect an external microphone (optional). This jack also accepts a "plug-in-power" microphone. When the external microphone is connected, it takes precedence.

45 **(headphones) jack (green)**
When you use headphones, the speaker on your camcorder is silent.

Remote Commander

The buttons that have the same name on the Remote Commander as on your camcorder function identically to the buttons on your camcorder.



1 **PHOTO button** (p. 45, 106, 110)

2 **DISPLAY button** (p. 39)

3 **SEARCH MODE button** (p. 72, 73)

4 **I◄◄ / ►►I buttons** (p. 72, 73)

5 **Video control buttons** (p. 41)

6 **Transmitter**
Point toward the remote sensor to control your camcorder after turning on your camcorder.

7 **ZERO SET MEMORY button** (p. 71)

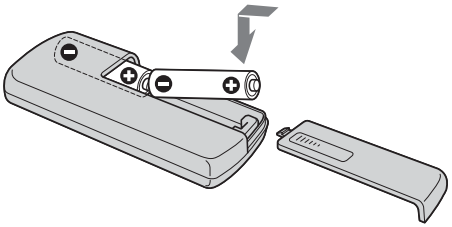
8 **START/STOP button** (p. 26)

9 **DATA CODE button** (p. 39)

10 **Power zoom button** (p. 32, 70, 129)

To prepare the Remote Commander

Insert two size AA (R6) batteries by matching the + and – on the batteries to the + and – in the battery compartment.

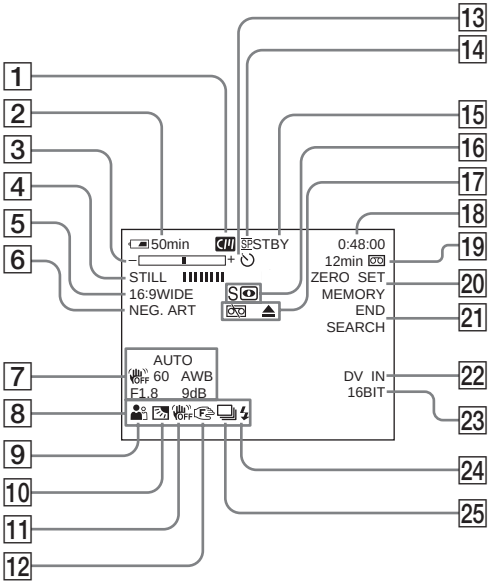


Notes on the Remote Commander

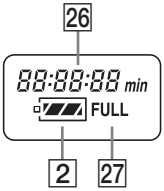
- Point the remote sensor away from strong light sources such as direct sunlight or overhead lighting. Otherwise, the Remote Commander may not function properly.
- Your camcorder works in the Commander mode VTR 2. Commander modes 1, 2 and 3 are used to distinguish your camcorder from other Sony VCRs to avoid erroneous remote control operation. If you use another Sony VCR in the Commander mode VTR 2, we recommend changing the Commander mode or covering the sensor of the VCR with black paper.

Operation indicators

LCD screen and Viewfinder



Display window



1 **Cassette Memory** (p. 12, 189)

2 **Remaining battery time** (p. 28)

3 **Zoom** (p. 32)**/Exposure** (p. 60)**/Data file name** (p. 124)

4 **Digital effect** (p. 55, 69)**/MEMORY MIX** (p. 112)**/Fader** (p. 51)

5 **16:9WIDE** (p. 49)

6 **Picture effect** (p. 54, 68)

7 **Data code** (p. 40)

8 **Volume** (p. 38)**/Date** (p. 28)**/Time** (p. 28)

9 **PROGRAM AE** (p. 58)

10 **Back light** (p. 33)

11 **SteadyShot off** (p. 169)

12 **Manual focus** (p. 62)

13 **Self-timer** (p. 47, 118)

14 **Recording mode** (p. 28)

15 **STBY/REC** (p. 28)**/Video control mode** (p. 41)**/Image size** (p. 103)**/Image quality** (p. 102)

16 **NIGHTSHOT** (p. 33)**/SUPER NIGHTSHOT** (p. 34)**/COLOR SLOW SHUTTER** (p. 34)

17 **Warning** (p. 187)

18 **Time code** (p. 28)**/Tape counter** (p. 28, 40)**/Self-diagnosis** (p. 186)**/Photo recording** (p. 45, 106)**/Image number** (p. 124)**/Playback folder** (p. 128)

19 **Remaining tape** (p. 28)**/Memory playback** (p. 124)

20 **ZERO SET MEMORY** (p. 71)

21 **END SEARCH** (p. 36)

22 **A/V → DV** (p. 163)**/DV IN** (p. 87)

23 **Audio mode** (p. 174)**/Recording folder** (p. 123)

24 **Flash**
This indicator appears only when the flash (optional) is in use.

25 **Continuous photo recording** (p. 108)

26 **Remaining battery time** (p. 28)**/Tape counter** (p. 28, 40)**/Image number/Memory capacity/Time code** (p. 28)**/Self-diagnosis** (p. 186)

27 **FULL charge** (p. 16)

Index

A, B

AC Adaptor 16
Adjusting the viewfinder 31
Audio dubbing 90
AUDIO MIX 170
AUDIO MODE 174
AUTO SHTR 168
A/V connecting cable 43, 75, 86, 163
BACK LIGHT 33
Battery Info 19
Battery pack 15
BEEP 176
BOUNCE 51

C, D

CALIBRATION 199
Cassette Memory 12, 189
C. CHROM 112
Charging battery pack 16
Charging built-in rechargeable battery 199
CLEANING CASSETTE 198
Clock set 21
Color Slow Shutter 34
Continuous photo recording 108
Data code 39
Date search 73
DEMO MODE 175
Digital effect 55, 69
Digital program editing 77, 121
DISPLAY 39
DOT 51
Dual sound track tape 190

E

Edit search 37
End search 36
EXP BRKTG 108

F, G, H

Fader 51
FLASH 55
Flexible Spot Meter 61
Format 172
Frame recording 65
Full charge 16
Grip belt 208
🎧 (headphone) jack 209
Heads 198
HiFi SOUND 170

I, J, K, L

i.LINK 194
i.LINK cable 75, 86, 163
Image protection 131
Image quality 102
Image size 103
Index screen 125
"InfoLITHIUM" battery pack 192
Infrared rays emitter 33, 79
Insert editing 88
Intelligent accessory shoe 91, 208
Interval Recording 64
Interval Photo Recording 115
JPEG 99
Labeling a cassette 97
LANC jack 209
LUMI. 55

M, N

Main sound 190
Manual exposure 60
Manual focus 62
M. CHROM 112
M. LUMI 112
MEMORY MIX 112
Memory PB ZOOM 129
Memory Photo recording 106
"Memory Stick" 99
"Memory Stick" capacity 103, 105
Menu settings 167
Mirror mode 30
Moisture condensation 197
MONOTONE 51
MOSC. FADER 51
M. OVERLAP 112
MPEG 99
Network function 165
NIGHTSHOT 33
NORMAL 108
NORM. FADER 51
NTSC system 196

O, P, Q

OLD MOVIE 55
OVERLAP 51
Operation indicators 211
PB FOLDR 128
Picture effect 54, 68
Picture search 41
Playback time 18
Print mark 136
PROGRAM AE 58

R

REC FOLDER 123
Recording time 17
Rec Review 37
Remaining battery time indicator 28
Remaining tape indicator 28
Remote Commander 210
Remote sensor 207
RESET 205
Resize 135

S

Self-diagnosis display 186
Self-timer recording 47, 118
Signal convert function 163
Skip scan 41
Slide show 130
SLOW SHTR 55
SPOT FOCUS 63
STEADYSHOT 169
Stereo tape 190
STILL 55
Sub sound 190
Super NightShot 34
S VIDEO jack 43

T, U, V

Tape counter 28
Tape PB ZOOM 70
Telephoto 32
Time code 28
Title 94
Title search 72
Touch panel 24
TRAIL 55
Transition 27
TV color systems 196
USB jack 137
USB Streaming 150

W, X, Y, Z

Warning indicators 187
Warning messages 188
White balance 48
Wide-angle 32
Wide mode 49
WIPE 51
Write-protect tab 99
Zero set memory 71
Zoom 32

http://www.sony.net/

Printed on 100% recycled paper using VOC (Volatile Organic Compound)-free vegetable oil based ink.

Printed in Japan

3 0 8 0 1 6 4 1 1

DCR-TRV38/TRV38E/TRV39

RMT-814

Ver 1.0 2003. 02
Revision History

SECTION 6
ADJUSTMENTS

ADJ

Link

- Before starting adjustment
  - Adjusting items when replacing main parts and boards
- CAMERA SECTION ADJUSTMENT
  - PREPARATIONS BEFORE ADJUSTMENT
  - INITIALIZATION OF 8, A, B, C, D, E, F, 18, 1B, 1C, 1E, 1F PAGE DATA
  - CAMERA SYSTEM ADJUSTMENTS
  - COLOR ELECTRONIC VIEWFINDER SYSTEM ADJUSTMENT
  - LCD SYSTEM ADJUSTMENT
- MECHANISM SECTION ADJUSTMENT
  - HOW TO ENTER RECORD MODE WITHOUT CASSETTE
  - HOW TO ENTER PLAYBACK MODE WITHOUT CASSETTE
  - TAPE PATH ADJUSTMENT
- VIDEO SECTION ADJUSTMENT
  - PREPARATIONS BEFORE ADJUSTMENTS
  - SYSTEM CONTROL SYSTEM ADJUSTMENT
  - SERVO AND RF SYSTEM ADJUSTMENT
  - VIDEO SYSTEM ADJUSTMENTS
  - AUDIO SYSTEM ADJUSTMENTS
- SERVICE MODE
  - ADJUSTMENT REMOTE COMMANDER
  - DATA PROCESS
  - SERVICE MODE

SONY®

9-876-230-51

Sony EMCS Co.

2003B1600-1

©2003.2

Published by DI Customer Center

TABLE OF CONTENTS

6. ADJUSTMENT

1. Before starting adjustment ····· 6-1
1-1. Adjusting items when replacing main parts and boards. · 6-2
6-1. CAMERA SECTION ADJUSTMENT ····· 6-4
1-1. PREPARATIONS BEFORE ADJUSTMENT (CAMERA SECTION) ····· 6-4
1-1-1. List of Service Tools ····· 6-4
1-1-2. Preparations ····· 6-5
1-1-3. Precaution ····· 6-7
1. Setting the Switch ····· 6-7
2. Order of Adjustments ····· 6-7
3. Subjects ····· 6-8
1-2. INITIALIZATION OF 8, A, B, C, D, E, F, 18, 1B, 1C, 1E, 1F PAGE DATA ····· 6-9
1-2-1. INITIALIZATION OF A, D PAGE DATA ····· 6-9
1. Initializing the A, D Page Data ····· 6-9
2. Modification of A, D Page Data ····· 6-9
3. A Page Table ····· 6-9
4. D Page Table ····· 6-10
1-2-2. INITIALIZATION OF B, 1B PAGE DATA ····· 6-11
1. Initializing the B, 1B Page Data ····· 6-11
2. Modification of B, 1B Page Data ····· 6-11
3. Writing the Network Default Setting Value (DCR-TRV39) ····· 6-11
4. B Page Table ····· 6-12
5. 1B Page Table ····· 6-12
1-2-3. INITIALIZATION OF 8, C, 18, 1C PAGE DATA ····· 6-13
1. Initializing the 8, C, 18, 1C Page Data ····· 6-13
2. Modification of 8, C, 18, 1C Page Data ····· 6-13
3. 8 Page Table ····· 6-14
4. C Page Table ····· 6-14
5. 18 Page Table ····· 6-15
6. 1C Page Table ····· 6-16
1-2-4. INITIALIZATION OF E, F, 1E, 1F PAGE DATA ····· 6-17
1. Initializing the E, F, 1E, 1F Page Data ····· 6-17
2. Modification of E, F, 1E, 1F Page Data ····· 6-17
3. E Page Table ····· 6-18
4. F Page Table ····· 6-19
5. 1E Page Table ····· 6-20
6. 1F Page Table ····· 6-20
1-3. CAMERA SYSTEM ADJUSTMENTS ····· 6-21
1. 54MHz/66MHz Origin Oscillation Adjustment (VC-315 board) ····· 6-21
2. HALL Adjustment ····· 6-21
3. MR Adjustment ····· 6-22
4. Flange Back Adjustment (Using Minipattern Box) ····· 6-23
5. Flange Back Adjustment (Using Flange Back Adjustment Chart and Subject More Than 500m Away) ····· 6-24
5-1. Flange Back Adjustment (1) ····· 6-24
5-2. Flange Back Adjustment (2) ····· 6-24
6. Flange Back Check ····· 6-25
7. MAX GAIN Adjustment ····· 6-25
8. Picture Frame Setting (Color Reproduction Adjustment Frame) ····· 6-26
9. Color Reproduction Adjustment ····· 6-27
10. LV Standard Data Input ····· 6-28
11. Picture Frame Setting (All White Frame) ····· 6-29
12. Auto White Balance Standard Data Input ····· 6-29
13. Auto White Balance Adjustment ····· 6-30
14. White Balance Check ····· 6-31
15. Mechanical Shutter Adjustment ····· 6-32
16. Steady Shot Check ····· 6-32
1-4. COLOR ELECTRONIC VIEWFINDER SYSTEM ADJUSTMENT ····· 6-33
1. VCO Adjustment (DI-089 board) ····· 6-33
1-1. Automatic Adjustment ····· 6-33
1-2. Manual Adjustment ····· 6-34
2. RGB AMP Adjustment (DI-089 board) ····· 6-35
2-1. Automatic Adjustment ····· 6-35
2-2. Manual Adjustment ····· 6-35
3. Contrast Adjustment (DI-089 board) ····· 6-36
3-1. Automatic Adjustment ····· 6-36
3-2. Manual Adjustment ····· 6-36
4. White Balance Adjustment (DI-089 board) ····· 6-37
1-5. LCD SYSTEM ADJUSTMENT ····· 6-38
1. VCO Adjustment (PD-190 board) ····· 6-38
2. RGB AMP Adjustment (PD-190 board) ····· 6-39
3. Contrast Adjustment (PD-190 board) ····· 6-39
4. COM AMP Adjustment (PD-190 board) ····· 6-40
5. V COM Adjustment (PD-190 board) ····· 6-40
6. White Balance Adjustment (PD-190 board) ····· 6-41
6-2. MECHANISM SECTION ADJUSTMENT ····· 6-42
2-1. HOW TO ENTER RECORD MODE WITHOUT CASSETTE ····· 6-42
2-2. HOW TO ENTER PLAYBACK MODE WITHOUT CASSETTE ····· 6-42
2-3. TAPE PATH ADJUSTMENT ····· 6-42
1. Preparation for Adjustment ····· 6-42
2. Processing after Completing Operations: ····· 6-42
6-3. VIDEO SECTION ADJUSTMENT ····· 6-43
3-1. PREPARATIONS BEFORE ADJUSTMENTS ····· 6-43
3-1-1. Equipment to Required ····· 6-43
3-1-2. Precautions on Adjusting ····· 6-44
3-1-3. Adjusting Connectors ····· 6-45
3-1-4. Connecting the Equipment ····· 6-45
3-1-5. Alignment Tapes ····· 6-46
3-1-6. Input/Output Level and Impedance ····· 6-46
3-2. SYSTEM CONTROL SYSTEM ADJUSTMENT ····· 6-47
1. Initialization of 8, A, B, C, D, E, F, 18, 1B, 1C, 1E, 1F Page Data ····· 6-47
2. Touch Panel Adjustment ····· 6-47
3. Serial No. Input ····· 6-47
3-1. Company ID Input ····· 6-47
3-2. Serial No. Input ····· 6-47
3-3. SERVO AND RF SYSTEM ADJUSTMENT ····· 6-49
1. Cap FG Duty Adjustment (VC-315 Board) ····· 6-49
2. Switching Position Adjustment (VC-315 Board) ····· 6-49
3. Error Rate Check ····· 6-50
3-1. Preparations before adjustments ····· 6-50
3-2. Error Rate Check ····· 6-50
3-3. Processing after Completing Adjustments ····· 6-50
3-4. VIDEO SYSTEM ADJUSTMENTS ····· 6-51
1. S VIDEO OUT Y Level Adjustment (VC-315 Board) ·· 6-51
2. S VIDEO OUT Chroma Level Adjustment (VC-315 Board) ····· 6-51
3. VIDEO OUT Y, Chroma Level Check (VC-315 Board) ····· 6-52
3-5. AUDIO SYSTEM ADJUSTMENTS ····· 6-53
1. Playback Level Check ····· 6-54
2. Overall Level Characteristics Check ····· 6-54
3. Overall Distortion Check ····· 6-54
4. Overall Noise Level Check ····· 6-54
5. Overall Separation Check ····· 6-54

6-4. SERVICE MODE ····· 6-55
4-1. ADJUSTMENT REMOTE COMMANDER ····· 6-55
1. Using the adjustment remote commander ····· 6-55
2. Precautions upon usingthe adjustment remote commander ····· 6-55
4-2. DATA PROCESS ····· 6-56
4-3. SERVICE MODE ····· 6-57
1. Setting the Test Mode ····· 6-57
2. Emergence Memory Address ····· 6-57
2-1. EMG Code (Emergency Code) ····· 6-57
2-2. MSW Code ····· 6-58
3. Bit value discrimination ····· 6-59
4. Switch check (1) ····· 6-59
5. Switch check (2) ····· 6-59
6. Switch check (3) ····· 6-60
7. Switch check (4) ····· 6-60
8. LED check ····· 6-60
9. Record of Use check (1) ····· 6-61
10. Record of Use check (2) ····· 6-61
11. Record of Self-diagnosis check ····· 6-62

Color reproduction frame is shown on page 6-63.

COVER

SECTION 6
ADJUSTMENTS

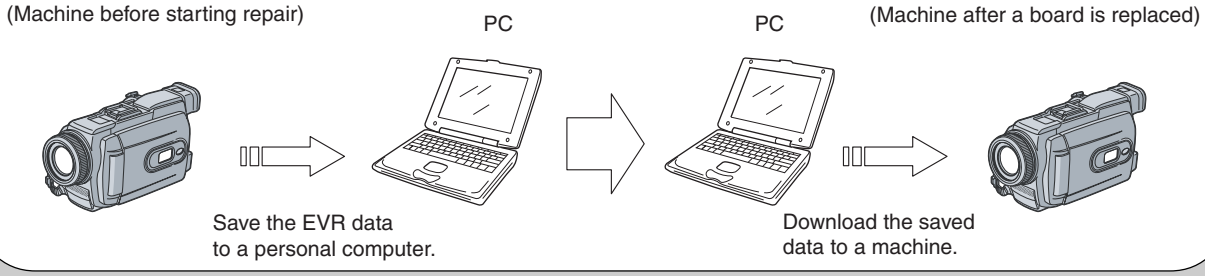
1. Before starting adjustment

EVR Data Re-writing Procedure When Replacing Board

The data that is stored in the repair board, is not necessarily correct.
Perform either procedure 1 or procedure 2 or procedure 3 when replacing board.

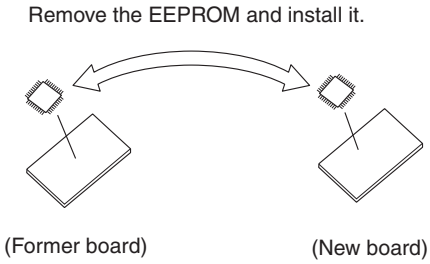
Procedure 1

Save the EVR data of the machine in which a board is going to be replaced. Download the saved data after a board is replaced.



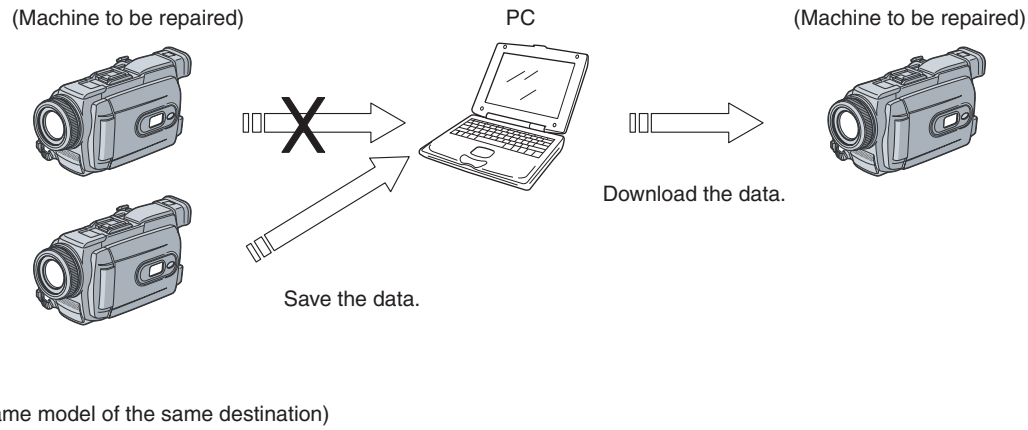
Procedure 2

Remove the EEPROM from the board of the machine that is going to be repaired. Install the removed EEPROM to the replaced board.



Procedure 3

When the data cannot be saved due to defective EEPROM, or when the EEPROM cannot be removed or installed, save the data from the same model of the same destination, and download it.



After the EVR data is saved and downloaded, check the respective items of the EVR data.
(Refer to page 6-3 for the items to be checked.)

COVER

1-1. Adjusting items when replacing main parts and boards.

• Adjusting items when replacing main parts

When replacing main parts, adjust the items indicated by ● in the following table.

Note1: When replacing the drum assy. or the mechanism deck, reset the data of page: 7, address: A7 to A9 to "00". (Refer to "Record of Use check" of "6-4. SERVICE MODE")

Adjustment Section	Adjustment	Replaced parts																										
		Block replacement								Parts replacement																		
		Lens device	Mechanism deck **Note1**	LCD block	LCD block	LCD block	EVFblock	Mechanism deck	Mechanism deck	CD-436 board	CD-436 board	DI-089 board	DI-089 board	LB-087 board	JK-248 board	PD-190 board	PD-190 board	VC-315 board	VC-315 board	VC-315 board	VC-315 board	VC-315 board	VC-315 board	VC-315 board	VC-315 board	VC-315 board
				LCD901 (LCD panel)	Touch panel	ND901 (Fluorescent tube)	LCD903 (LCD panel)	M901 (Drum assy) **Note1**	MD block	IC7001 (CCD imager)	IC7002 (S/H)	IC3201 (RGB driver (EVF))	IC3202 (Timing generator (EVF))	D5602 (Backlight (EVF))	SE5001/5002 (PITCH/YAW sensor)	IC5501 (RGB driver (LCD))	IC5502 (Timing generator (LCD))	IC1501, X1501 (Timing generator)	IC1503 (A/D conv.)	IC2101 (Camera DV signal process, etc.)	IC2301 (DV signal process,RF signal process)	IC1801 (REC/PB AMP)	IC1901 (Video IN/OUT)	IC1701 (EVR)				
Initialization of 8, A, B, C, D, E, F, 18, 1B, 1C, 1E, 1F page data	Initialization of A, D page data																									
	Initialization of B, 1B page data																									
	Initialization of 8, C, 18, 1C page data																									
	Initialization of E, F, 1E, 1F page data																									
Camera	54MHz/66MHz origin oscillation adj.																	●								●
	HALL adj.	●																								
	MR adj.	●																								
	Flange back adj.	●								●																
	MAX GAIN adj.									●	●								●							
	Color reproduction adj.									●	●								●							
	LV standard data input									●	●								●							
	Auto white balance standard data input									●	●								●							
	Auto white balance adj.									●	●								●							
	Mechanical shutter adj.	●																								
	Steady shot check														●											
Color EVF	VCO adj.											●	●													
	RGB AMP adj.											●														
	Contrast adj.											●								●						
	White balance adj.						●					●		●												
LCD	VCO adj.															●	●									
	RGB AMP adj.															●										
	Contrast adj.															●				●						
	COM AMP adj.															●										
	V COM adj.															●										
	White balance adj.			●		●										●										
Mechanism	Tape path adj.		●					●	●																	
System control	Touch panel adj.			●	●																					
	Serial No. input																									
Servo, RF	CAP FG duty adj.		●						●																	
	Switching position adj.		●					●	●																	
	Error rate check		●					●	●												●	●				
Video	S VIDEO OUT Y level adj.																			●			●			
	S VIDEO OUT chroma level adj.																			●			●			

Table. 6-1-1 (1).

• Adjusting items when replacing a board or EEPROM

When replacing a board or EFPROM, adjust the items indicated by ● in the following table.

Adjustment Section	Adjustment	Board replacement						EEPROM replacement			
		CD-436 board (COMPLETE)	JK-248 board (COMPLETE)	LB-087 board (COMPLETE)	PD-190 board (COMPLETE)	DI-089 board (COMPLETE)	VC-315 board (COMPLETE) **Note2**	VC-315 board IC2602 (EEPROM)	VC-315 board IC2702 (EEPROM)	VC-315 board IC2803 (Flash memory)	Supporting RadarW
Initialization of 8, A, B, C, D, E, F, 18, 1B, 1C, 1E, 1F page data	Initialization of A, D page data						●		●		
	Initialization of B, 1B page data						●		●		
	Initialization of 8, C, 18, 1C page data						●	●			
	Initialization of E, F, 1E, 1F page data						●	●			
Camera	54MHz/66MHz origin oscillation adj.						●	●			
	HALL adj.						●	●			●
	MR adj.						●	●			●
	Flange back adj.	●					●	●			●
	MAX GAIN adj.	●					●	●			●
	Color reproduction adj.	●					●	●			
	LV standard data input	●					●	●			●
	Auto white balance standard data input	●					●	●			●
	Auto white balance adj.	●					●	●			●
	Mechanical shutter adj.						●	●			●
	Steady shot check		●				●	●			●
Color EVF	VCO adj.					●	●	●			●
	RGB AMP adj.					●	●	●			●
	Contrast adj.					●	●	●			●
	White balance adj.			●		●	●	●			
LCD	VCO adj.				●		●	●			
	RGB AMP adj.				●		●	●			
	Contrast adj.				●		●	●			
	COM AMP adj.				●		●	●			
	V COM adj.				●		●	●			
	White balance adj.				●		●	●			
Mechanism	Tape path adj.										
System control	Touch panel adj.						●		●		
	Serial No. input						●	●			
Servo, RF	CAP FG duty adj.						●	●			●
	Switching position adj.						●	●			●
	Error rate check						●	●			●
Video	S VIDEO OUT Y level adj.						●	●			
	S VIDEO OUT chroma level adj.						●	●			

Table. 6-1-1 (2).

Note2: DCR-TRV39 only.
When replacing the VC-315 board, before and after replacing, perform "Writing the Network Default Setting Value" and initialize the personal network information (Mail address, bookmark etc.). (Refer to "1-2-2. INITIALIZATION OF B, 1B PAGE DATA".)

COVER

6-1. CAMERA SECTION ADJUSTMENT

1-1. PREPARATIONS BEFORE ADJUSTMENT (CAMERA SECTION)

1-1-1. List of Service Tools

• Oscilloscope • Color monitor • Vectorscope
• Regulated power supply • Digital voltmeter

Ref. No.	Name	Parts Code	Usage
J-1	Filter for color temperature correction (C14)	J-6080-058-A	Auto white balance adjustment/check White balance adjustment/check
J-2	ND filter 1.0	J-6080-808-A	White balance check
	ND filter 0.4	J-6080-806-A	White balance check
	ND filter 0.1	J-6080-807-A	White balance check
J-3	Pattern box PTB-450	J-6082-200-A	
J-4	Color chart for pattern box	J-6020-250-A	
J-5	Adjustment remote commander (RM-95 upgraded)	J-6082-053-B	
J-6	Siemens star chart	J-6080-875-A	For checking the flange back
J-7	Clear chart for pattern box	J-6080-621-A	
J-8	CPC-7 jig	J-6082-382-A	For adjusting the color viewfinder For adjusting the LCD block For adjusting the tape path
J-9	Extension cable (100P, 0.5mm)	J-6082-352-A	For extension between the DI-089 board (CN4004) and the VC-315 board (CN1003)
J-10	Mini pattern box	J-6082-353-B	For adjusting the flange back
J-11	Camera table	J-6082-384-A	For adjusting the flange back

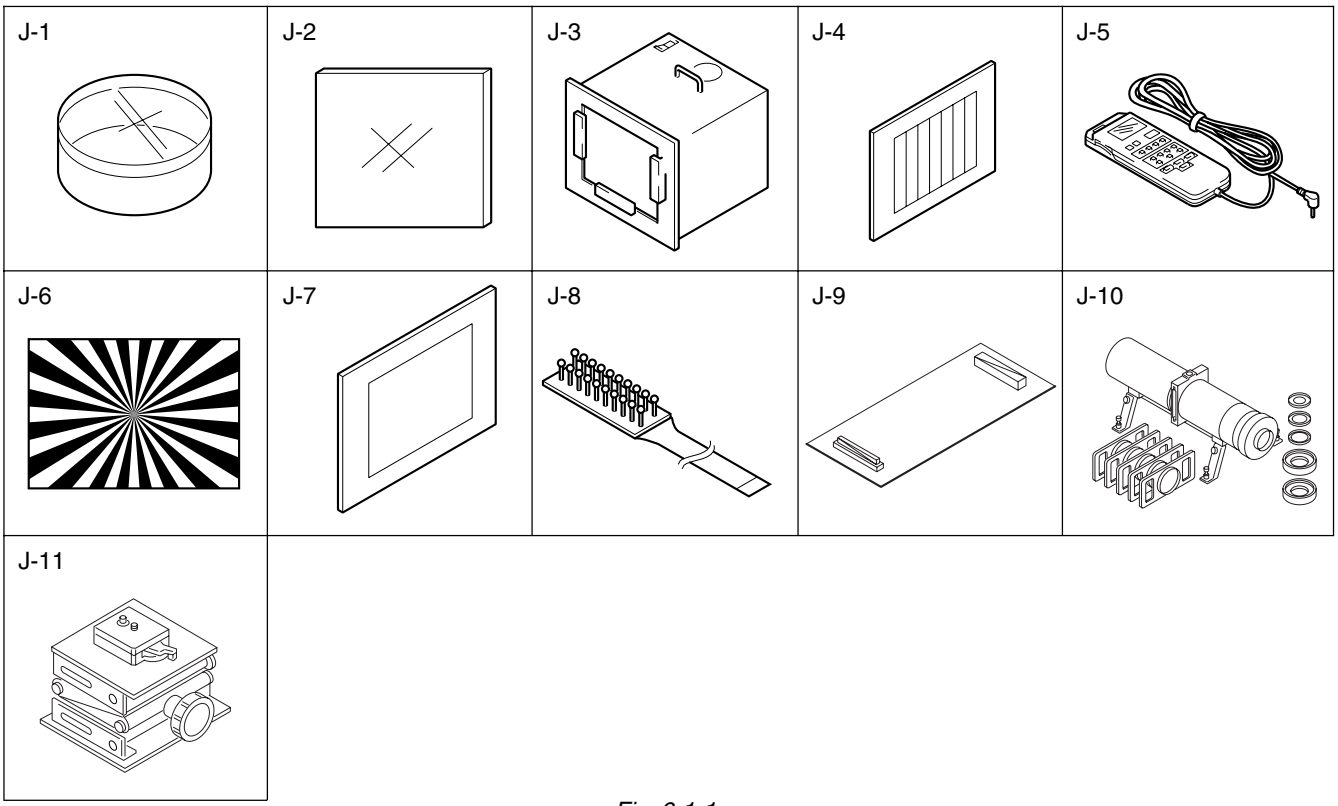


Fig. 6-1-1.

1-1-2. Preparations

Note1: For details of how remove the cabinet and boards, refer to "2. DISASSEMBLY".

Note2: When performing only the adjustments, the lens block and boards need not be disassembled.

Note3: Before performing the adjustments, check the data of page: 0, address: 10 is "00". If not, set data: 00 to this address.

1) Connect the equipment for adjustments according to Fig. 6-1-3.

Note4: As removing the cabinet (R) assembly (removing CN1007 of the VC-315 board) means removing the lithium 3V power supply (BT5201 on the CK-131 board), data such as date, time, user-set menus will be lost. After completing adjustments, reset these data. But the self-diagnosis data and the data on history of use (total drum rotation time etc.) will be kept even if the lithium 3V power supply is removed. (Refer to "5-4.Service Mode" for the self-diagnosis data and the data on history of use.)

Note5: Setting the "Forced Camera Power ON" Mode
1) Select page: 0, address: 01, and set data: 01.
2) Select page: D, address: 10, set data: 01, and press the PAUSE button.
The above procedure will enable the camera power to be turned on with the control switch block (PS-2890) removed. After completing adjustments, be sure to exit the "Forced Camera Power ON Mode".

Note6: Exiting the "Forced Camera Power ON" Mode
1) Select page: 0, address: 01, and set data: 01.
2) Select page: D, address: 10, set data: 00, and press the PAUSE button.
3) Select page: 0, address: 01, and set data: 00.

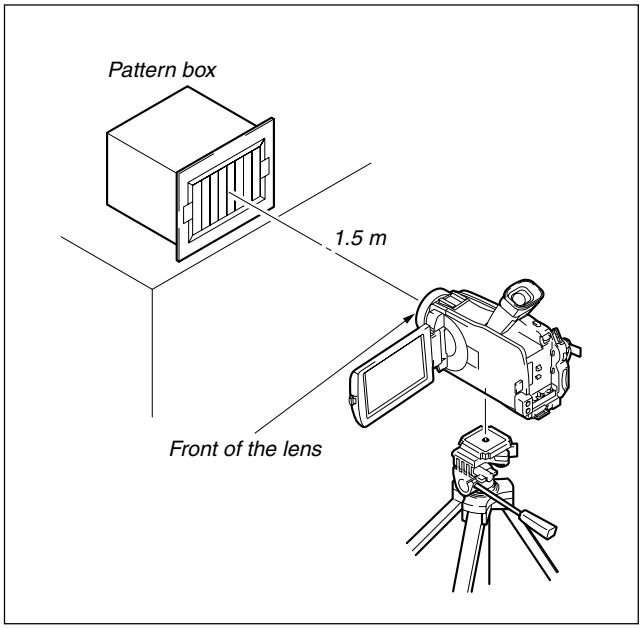


Fig. 6-1-2.

[CONNECTION OF EQUIPMENT]

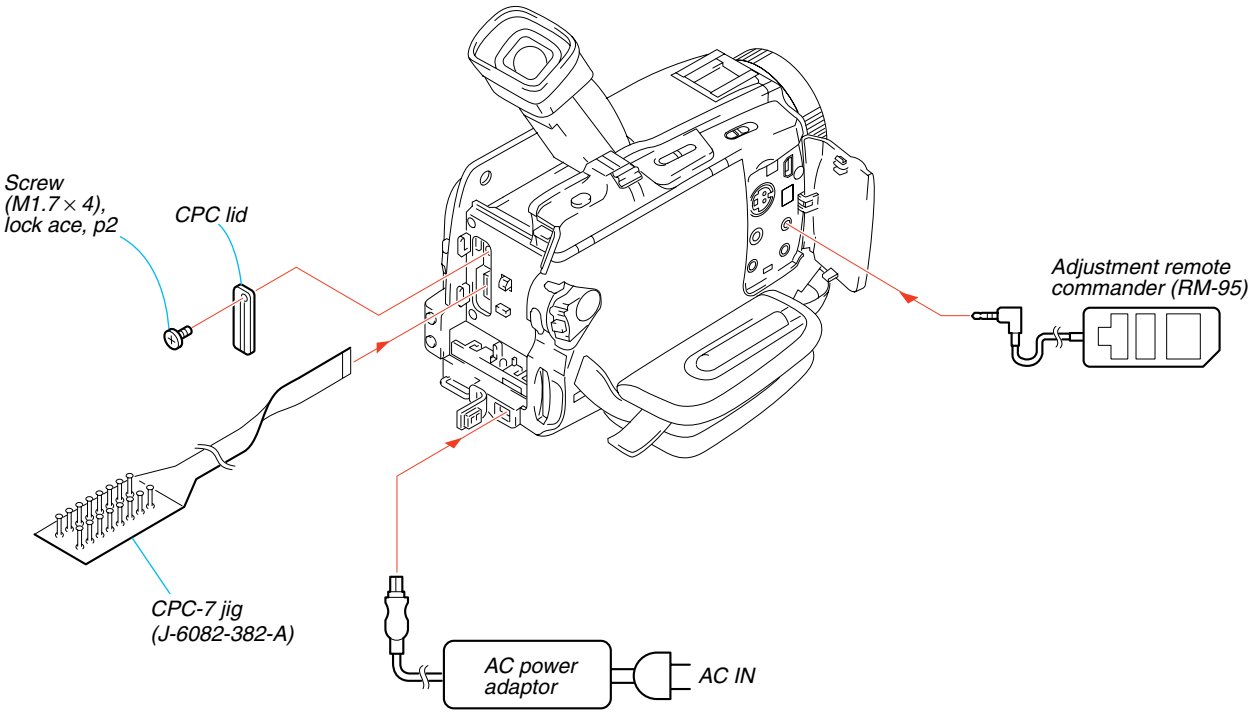


Fig. 6-1-3.

1-1-3. Precaution

1. Setting the Switch

Unless otherwise specified, set the switches as follows and perform adjustments without loading cassette.

1. POWER switch (PS-2890 block) ..... CAMERA
2. NIGHT SHOT switch (Lens block) ..... OFF
3. FOCUS switch (FP-635 flexible) ..... MANUAL
4. BACK LIGHT switch (FP-635 flexible) ..... OFF
5. FUNCTION settings (Touch panel)
   - SPOT METER (Page1) ..... AUTO
   - MANUAL SET of the MENU settings (Page1)
     - PROGRAM AE ..... AUTO
     - PICTURE EFFECT ..... OFF
     - WHITE BALANCE ..... AUTO
     - AUTO SHUTTER ..... OFF
   - CAMERA SET of the MENU settings (Page1)
     - DIGITAL ZOOM ..... OFF
     - 16:9 WIDE ..... OFF
     - STEADY SHOT ..... OFF
   - SETUP MENU of the MENU settings (Page1)
     - DEMO MODE ..... OFF
   - EXPOSURE (Page1) ..... OFF
   - DIGITAL EFFECT (Page2) ..... OFF
   - COLOR SLOW SHUTTER (Page3) ..... OFF

2. Order of Adjustments

Basically carry out adjustments in the order given.

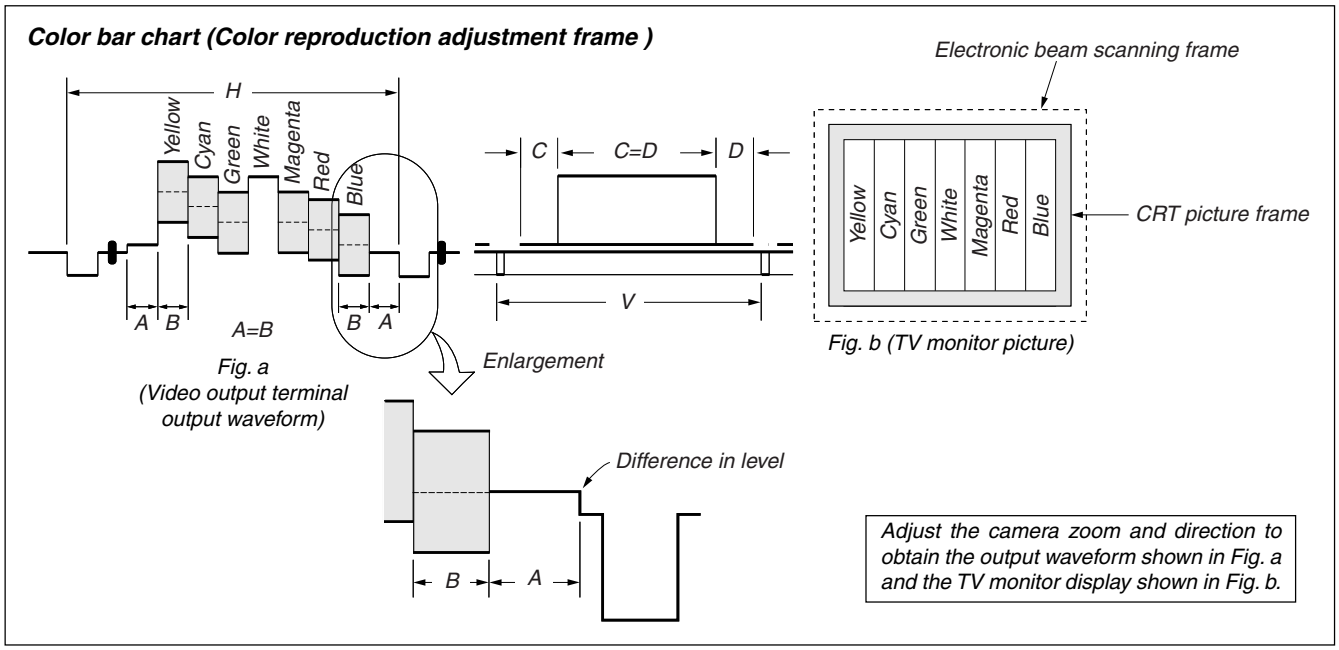


Fig. 6-1-4.

3. Subjects

1) Color bar chart (Color reproduction adjustment frame)
   When performing adjustments using the color bar chart, adjust the picture frame as shown in Fig. 6-1-4. (Color reproduction adjustment frame)
2) Clear chart (Color reproduction adjustment frame)
   Remove the color bar chart from the pattern box and insert a clear chart in its place. (Do not perform zoom operations during this time.)
3) Flange back adjustment chart
   Make the chart shown in Fig. 6-1-5 using A0 size (1189mm × 841mm) black and white vellum paper.

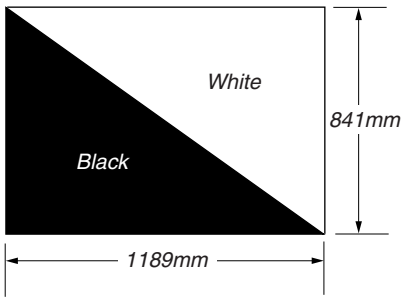


Fig. 6-1-5.

Note: Use matte vellum paper bigger than A0, and make sure the edges of the black and white paper joined together are not rough.

COVER

1-2. INITIALIZATION OF 8, A, B, C, D, E, F, 18, 1B, 1C, 1E, 1F PAGE DATA

Note: When reading or writing the 18, 1B, 1C, 1E or 1F page data, select page: 0, address: 10, and set data: 01, then select 8, B, C, E or F page. The 18, 1B, 1C, 1E or 1F page can be chosen by this data setting.
After reading or writing, reset the data of page: 0, address: 10 to "00".

[Connection of the power supply during the initialization of the data.]

1) Connect the regulated power supply and the digital voltmeter to the battery terminal as shown in Fig. 6-1-6.
2) Adjust the output voltage of the regulated power supply so that the digital voltmeter display is 6.3 ± 0.1Vdc.
3) Turn off the power supply.
4) Turn on the HOLD switch of the adjusting remote commander.
5) Turn on the power supply.
6) Perform the initialization of the data.
   Note: This is normal though the following message is indicated on the LCD screen.
   "FOR InfoLITHIUM BATTERY ONLY"

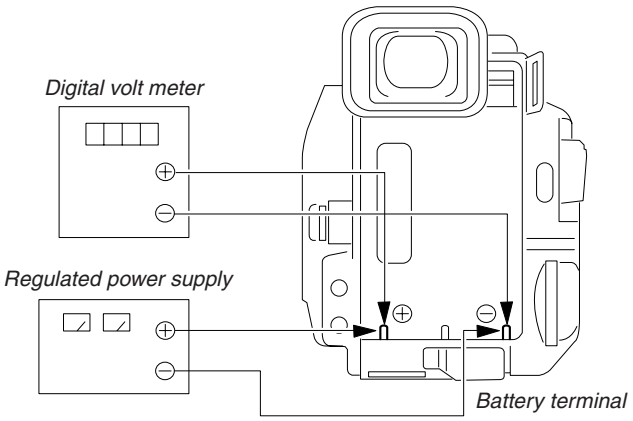


Fig. 6-1-6.

[Initialization Procedure]

1. Initialization of A, D page data
2. Initialization of B, 1B page data
3. Initialization of 8, C, 18, 1C page data
4. Initialization of E, F, 1E, 1F page data

1-2-1. INITIALIZATION OF A, D PAGE DATA

Note: The data of page: 0, address: 10 must be "00".

1. Initializing the A, D Page Data

Note1: If "Initializing the A, D Page Data" is performed, all data of the A page and D page will be initialized. (It is impossible to initialize a single page.)

Note2: If the A, D page data has been initialized, the following adjustments need to be performed again.
1) Modification of A, D page data
2) Touch panel adjustment

Note3: The power supply voltage must be 6.3 ± 0.1Vdc.

Adjusting page	A
Adjusting Address	10 to FF
Adjusting page	D
Adjusting Address	10 to 6F

Initializing Method:

Order	Page	Address	Data	Procedure
1	0	01	01	Set the data.
2	0	10	00	Set the data.
3	7	03		Set the following data. 04 (DCR-TRV38/TRV39 (NTSC)) 84 (DCR-TRV38E (PAL))
4	7	00		Set the following data. 20 (Initializing A page) 22 (Initializing D page) 28 (Initializing A and D pages)
5	7	01		Set the following data, and press PAUSE button. 20 (Initializing A page) 22 (Initializing D page) 28 (Initializing A and D pages)
6	7	02		Check that the data changes to "01"
7				Perform "Modification of A, D Page Data".

2. Modification of A, D Page Data

If the A, D page data has been initialized, change the data of the "Fixed data-2" address shown in the following tables by manual input.

Modifying Method:

1) Before changing the data, select page: 0, address: 01, and set data: 01.
2) New data for changing are not shown in the tables because they are different in destination. When changing the data, copy the data built in the same model.
   Note: If copy the data built in the different model, the camcorder may not operate.
3) When changing the data, press the PAUSE button of the adjustment remote commander each time when setting new data to write the data in the non-volatile memory.

Processing after Completing Modification of A, D Page data

Order	Page	Address	Data	Procedure
1	2	00	29	Set the data.
2	2	01	29	Set the data, and press PAUSE button.

Note: If the following symptoms occur after completing of the "Modification of A, D page data", check that the data of the "Fixed data-2" addresses of A and D page are same as those of the same model of the same destination.
1) The self-diagnosis code "E:20:00" on the LCD screen is displayed.
2) The power is shut off so that unit cannot operate.

3. A Page Table

Note1: The data of page: 0, address: 10 must be "00".

Note2: Fixed data-1: Initialized data. (Refer to "1. Initializing the A, D Page Data".)
Fixed data-2: Modified data. (Refer to "2. Modification of A, D Page Data").

Address	Initial value		Remark
	NTSC	PAL	
00 to 0F			
10 to 17	Fixed data-1		
18	Fixed data-2		
19 to 2A	Fixed data-1		
2B	Fixed data-2		
2C to 2F	Fixed data-1		
2F	Fixed data-2		
30 to 41	Fixed data-1		
42	Fixed data-2		
43 to 51	Fixed data-1		
52	Fixed data-2		
53	Fixed data-1		
54	Fixed data-2		
55 to 5C	Fixed data-1		
5D	Fixed data-2		
5E to 8F	Fixed data-1		
90	CD	CC	Touch panel adj.
91	20	1D	
92	CF	C4	
93	1C	28	
94 to FF	Fixed data-1		

Table. 6-1-2.

4. D Page Table

Note1: The data of page: 0, address: 10 must be “00”.

Note2: Fixed data-1: Initialized data. (Refer to “1. Initializing the A, D Page Data”.)
Fixed data-2: Modified data. (Refer to “2. Modification of A, D Page Data”).

Address	Initial value	Remark
00 to 0F		
10	00	Test mode
11		Fixed data-1
12		Fixed data-2
13		
14 to 15		Fixed data-1
16		Fixed data-2
17 to 19		Fixed data-1
2A		Fixed data-2
2B to 37		Fixed data-1
38		Fixed data-2
39		Fixed data-1
3A		Fixed data-2
3B to 55		Fixed data-1
56		Fixed data-2 (Modified data. Copy the data built in the same model.)
57		
58		
59		
5A to 63		Fixed data-1
64		Fixed data-2
65		
66 to 6E		Fixed data-1
6F		Fixed data-2

Table. 6-1-3.

1-2-2. INITIALIZATION OF B, 1B PAGE DATA

Note: When reading or writing the B page data, select page: 0, address: 10, and set data: 00.
When reading or writing the 1B page data, select page: 0, address: 10, and set data: 01, then select B page. The 1B page can be chosen by this data setting.
After reading or writing, reset the data of page: 0, address: 10 to "00".

1. Initializing the B, 1B Page Data

Note1: If "Initializing the B, 1B Page Data" is performed, all data of the B page and 1B page will be initialized. (It is impossible to initialize a single page.)

Note2: If the B, 1B page data has been initialized, the following adjustments need to be performed again.
1) Modification of B, 1B page data

Note3: The power supply voltage must be 6.3 ± 0.1Vdc.

Adjusting page	B
Adjusting Address	00 to FF
Adjusting page	1B
Adjusting Address	00 to FF

Initializing Method:

Order	Page	Address	Data	Procedure
1	0	01	01	Set the data.
2	0	10	00	Set the data.
3	5	02	FF	Set the data, and press PAUSE button.
4	5	01	F3	Set the data, and press PAUSE button.
5	5	00	01	Set the data, and press PAUSE button.
6	5	02		Check that the data changes to "00".
7				Perform "Modification of B, 1B Page Data".

2. Modification of B, 1B Page Data

If the B, 1B page data has been initialized, change the data of the "Fixed data-2" address shown in the following tables by manual input.

Modifying Method:

1) Before changing the data, select page: 0, address: 01, and set data: 01.
2) When changing the B page data, select page: 0, address: 10, and set data: 00.
3) When changing the 1B page data, select page: 0, address: 10, and set data: 01.
   After completing the modification of 1B page data, reset the data of this address to "00".
4) New data for changing are not shown in the tables because they are different in destination. When changing the data, copy the data built in the same model.
   Note: If copy the data built in the different model, the camcorder may not operate.
5) When changing the data, press the PAUSE button of the adjustment remote commander each time when setting new data to write the data in the non-volatile memory.

Processing after Completing Modification of B, 1B Page data:

Order	Page	Address	Data	Procedure
1	0	10	00	Set the data.
2	2	00	29	Set the data.
3	2	01	29	Set the data, and press PAUSE button.

3. Writing the Network Default Setting Value (DCR-TRV39)

Writing method:

Order	Page	Address	Data	Procedure
1	0	01	01	Set the data.
2	0	10	00	Set the data.
3	5	0E	00	Set the data, and press PAUSE button.
4	5	01	F8	Set the data, and press PAUSE button.
5	5	00	01	Set the data, and press PAUSE button.
6	5	0E		Check that the data is "01".
7	0	01	00	Set the data.

4. B Page Table

Note1: The data of page: 0, address: 10 must be “00”.

Note2: Fixed data-1: Initialized data. (Refer to “1. Initializing the B, 1B Page Data”.)
Fixed data-2: Modified data. (Refer to “2. Modification of B, 1B Page Data”).

Address	Remark
00 to 02	Fixed data-1
03	Fixed data-2
04 to AA	Fixed data-1
AB	Fixed data-2
AC to AF	Fixed data-1
B0	Fixed data-2
B1 to B6	Fixed data-1
B7	Fixed data-2
B8 to BA	Fixed data-1
BB	Fixed data-2
BC	Fixed data-1
BD	Fixed data-2
BE to FF	Fixed data-1

Table. 6-1-4.

5. 1B Page Table

Note1: When reading or writing the 1B page data, select page: 0, address: 10, and set data: 01, then select B page. The 1B page can be chosen by this data setting.
After reading or writing, reset the data of page: 0, address: 10 to “00”.

Note2: Fixed data-1: Initialized data. (Refer to “1. Initializing the B, 1B Page Data”.)
Fixed data-2: Modified data. (Refer to “2. Modification of B, 1B Page Data”).

Address	Remark
00	Fixed data-2
01 to FF	Fixed data-1

Table. 6-1-5.

1-2-3. INITIALIZATION OF 8, C, 18, 1C PAGE DATA

Note: When reading or writing the 8, C page data, select page: 0, address: 10, and set data: 00.
When reading or writing the 18, 1C page data, select page: 0, address: 10, and set data: 01, then select 8 or C page. The 18 or 1C page can be chosen by this data setting.
After reading or writing, reset the data of page: 0, address: 10 to "00".

1. Initializing the 8, C, 18, 1C Page Data

Note1: If "Initializing the 8, C, 18, 1C Page Data" is performed, all data of the 8 page, C page, 18 page and 1C page will be initialized. (It is impossible to initialize a single page.)

Note2: If the 8, C, 18, 1C page data has been initialized, following adjustments need to be performed again.
1) Modification of 8, C, 18, 1C page data
2) Viewfinder system adjustments
3) LCD system adjustments
4) Serial No. input
5) Servo and RF system adjustments
6) Video system adjustments

Note3: The power supply voltage must be 6.3 ± 0.1Vdc.

Adjusting page	8
Adjusting Address	00 to FF
Adjusting page	C
Adjusting Address	10 to FF
Adjusting page	18
Adjusting Address	00 to FF
Adjusting page	1C
Adjusting Address	00 to FF

Initializing Method:

Order	Page	Address	Data	Procedure
1	0	01	01	Set the data.
2	0	10	00	Set the data.
3	3	81		Check that the data is "00".
4	3	80	0C	Set the data, and press PAUSE button.
5	3	80		Check that the data changes to "1C".
6				Perform "Modification of 8, C, 18, 1C Page Data".

2. Modification of 8, C, 18, 1C Page Data

If the 8, C, 18, 1C page data has been initialized, change the data of the "Fixed data-2" address shown in the following table by manual input.

Modifying Method:

1) Before changing the data, select page: 0, address: 01, and set data: 01.
2) When changing the 8, C page data, select page: 0, address: 10, and set data: 00.
3) When changing the 18, 1C page data, select page: 0, address: 10, and set data: 01.
   After completing the modification of 18, 1C page data, reset the data of this address to "00".
4) New data for changing are not shown in the tables because they are different in destination. When changing the data, copy the data built in the same model.
   Note: If copy the data built in the different model, the camcorder may not operate.
5) When changing the data, press the PAUSE button of the adjustment remote commander each time when setting new data to write the data in the non-volatile memory.
6) Check that the data of adjustment addresses is the initial value. If not, change the data to the initial value.

Processing after Completing Modification of 8, C, 18, 1C Page data

Order	Page	Address	Data	Procedure
1	0	10	00	Set the data.
2	2	00	29	Set the data.
3	2	01	29	Set the data, and press PAUSE button.

3. 8 Page Table

Note1: The data of page: 0, address: 10 must be “00”.

Note2: Fixed data-1: Initialized data. (Refer to “1. Initializing the 8, C, 18, 1C Page Data”.)
Fixed data-2: Modified data. (Refer to “2. Modification of 8, C, 18, 1C Page Data”).

Address	Remark
00 to 18	Fixed data-1
19	Fixed data-2
1F to 29	Fixed data-1
2A	Fixed data-2
2B to 3F	Fixed data-1
40	Fixed data-2
41 to 79	Fixed data-1
7A	Fixed data-2
7B to 83	Fixed data-1
84	Fixed data-2 (Modified data. Copy the data built in the same model.)
85	
86	
87	
88	
89	
8A to 91	Fixed data-1
92	Fixed data-2
93 to 94	Fixed data-1
95	Fixed data-2
96 to AC	Fixed data-1
AD	Fixed data-2
AE to B0	Fixed data-1
B1	Fixed data-2 (Modified data. Copy the data built in the same model.)
B2	
B3	
B4 to B5	Fixed data-1
B6	Fixed data-2
B7 to B9	Fixed data-1
BA	Fixed data-2
BC to CB	Fixed data-1
CC	Fixed data-2
CB to D7	Fixed data-1
D8	Fixed data-2
D9 to DA	Fixed data-1
DB	Fixed data-2
DC	
DD	Fixed data-1
DE	Fixed data-2 (Modified data. Copy the data built in the same model.)
DF	
E0	
E1 to E4	Fixed data-1
E5	Fixed data-2
E6 to E7	Fixed data-1
E8	Fixed data-2
E9 to EC	Fixed data-1
ED	Fixed data-2
EE to FF	Fixed data-1

Table. 6-1-6.

4. C Page Table

Note1: The data of page: 0, address: 10 must be “00”.

Note2: Fixed data-1: Initialized data. (Refer to “1. Initializing the 8, C, 18, 1C Page Data”.)
Fixed data-2: Modified data. (Refer to “2. Modification of 8, C, 18, 1C Page Data”).

Address	Initial value	Remark
00 to 0F		
10	EE	Switching position adj.
11	00	
12	00	
13	00	
14 to 15		Fixed data-1
16	E0	CAP FG duty adj.
17 to 24		Fixed data-1
25	5D	S VIDEO out Y level adj.
26	7D	S VIDEO out Cr level adj.
27	59	S VIDEO out Cb level adj.
28 to 33		Fixed data-1
34		Fixed data-2
35		
36	87	VCO adj. (EVF)
37	6F	
38		Fixed data-2
39	97	RGB AMP adj. (EVF)
3A to 3B		Fixed data-1
3C	80	White balance adj. (EVF)
3D	80	
3E	37	Contrast adj. (EVF)
3F		Fixed data-1
40		Fixed data-2
41 to 42		Fixed data-1
43		Fixed data-2 (Modified data. Copy the data built in the same model.)
44		
45		
46		
47	98	VCO adj. (LCD)
48	98	
49	91	V COM adj. (LCD)
4A	2C	RGB AMP adj. (LCD)
4B		Fixed data-1
4C	A1	COM AMP adj. (LCD)
4D	7F	White balance adj. (LCD)
4E	87	
4F	3F	Contrast adj. (LCD)
50		Fixed data-2
51 to 52		Fixed data-1
53		Fixed data-2
54		
55		Fixed data-1
56		Fixed data-2
57		Fixed data-1
58		Fixed data-2
59		
5A to 60		Fixed data-1

C Page

Address	Initial value	Remark
61		Fixed data-2
62		(Modified data. Copy the data
63		built in the same model.)
64		
65 to A3		Fixed data-1
A4		Fixed data-2
A5 to CB		Fixed data-1
CC		Fixed data-2
CD		(Modified data. Copy the data
CE		built in the same model.)
CF		
D0		
D1		
D2		
D3		
D4		
D5		
D6 to DE		Fixed data-1
DF		Fixed data-2
E0	08	Serial No. input
E1	00	
E2	46	
E3	01	
E4	02	
E5	00	
E6	00	
E7	00	
E8 to F3		Fixed data-1
F4	00	Emergency memory address
F5	00	
F6	00	
F7	00	
F8	00	
F9	00	
FA	00	
FB	00	
FC	00	
FD	00	
FE	00	
FF	00	

Table. 6-1-7.

5. 18 Page Table

Note1: When reading or writing the 18 page data, select page: 0, address: 10, and set data: 01, then select 8 page. The 18 page can be chosen by this data setting.
After reading or writing, reset the data of page: 0, address: 10 to "00".

Note2: Fixed data-1: Initialized data. (Refer to "1. Initializing the 8, C, 18, 1C Page Data".)
Fixed data-2: Modified data. (Refer to "2. Modification of 8, C, 18, 1C Page Data").

Address	Remark
00	Fixed data-1
01	Fixed data-2
02 to FF	Fixed data-1

Table. 6-1-8.

6. 1C Page Table

Note1: When reading or writing the 1C page data, select page: 0, address: 10, and set data: 01, then select C page. The 1C page can be chosen by this data setting.
After reading or writing, reset the data of page: 0, address: 10 to "00".

Note2: Fixed data-1: Initialized data. (Refer to "1. Initializing the 8, C, 18, 1C Page Data".)
Fixed data-2: Modified data. (Refer to "2. Modification of 8, C, 18, 1C Page Data").

Address	Initial value	Remark
00 to B2	Fixed data-1	
B3	00	Error rate check
B4	00	
B5	00	
B6	00	
B7	00	
B8	80	
B9	00	
BA	00	
BB	00	
BC	00	
BD	00	
BE	00	
BF	00	
C0	00	
C1	00	
C2	00	
C3	80	
C4	00	
C5	00	
C6	00	
C7	00	
C8	00	
C9 to FF	Fixed data-1	

Table. 6-1-9.

1-2-4. INITIALIZATION OF E, F, 1E, 1F PAGE DATA

Note: When reading or writing the E, F page data, select page: 0, address: 10, and set data: 00.
When reading or writing the 1E, 1F page data, select page: 0, address: 10, and set data: 01, then select E or F page. The 1E or 1F page can be chosen by this data setting.
After reading or writing, reset the data of page: 0, address: 10 to "00".

1. Initializing the E, F, 1E, 1F Page Data

Note1: If "Initializing the E, F, 1E, 1F Page Data" is performed, all data of the E page, F page, 1E page and 1F page will be initialized. (It is impossible to initialize a single page.)
Note2: If the E, F, 1E, 1F page data has been initialized, following adjustments need to be performed again.
1) Modification of E, F, 1E, 1F page data
2) Camera system adjustments
Note3: The power supply voltage must be 6.3 ± 0.1Vdc.
Note4: NTSC model: DCR-TRV38/TRV39
PAL model: DCR-TRV38E

Adjusting page	E
Adjusting Address	00 to FF
Adjusting page	F
Adjusting Address	10 to FF
Adjusting page	1E
Adjusting Address	00 to FF
Adjusting page	1F
Adjusting Address	00 to FF

Initializing Method:

Order	Page	Address	Data	Procedure
1	0	01	01	Set the data.
2	0	10	00	Set the data.
3	6	01		Set the following data, and press PAUSE button. 2D (NTSC), 2F (PAL)
4	6	03	01	Set the data, and press PAUSE button.
5	6	02		Check that the data changes to "01".
6				Perform "Modification of E, F, 1E, 1F Page Data".

2. Modification of E, F, 1E, 1F Page Data

If the E, F, 1E, 1F page data has been initialized, change the data of the "Fixed data-2" address shown in the following table by manual input.

Modifying Method:

1) Before changing the data, select page: 0, address: 01, and set data: 01.
2) When changing the E, F page data, select page: 0, address: 10, and set data: 00.
3) When changing the 1F page data, select page: 0, address: 10, and set data: 01.
After completing the modification of 1F page data, reset the data of this address to "00".
4) New data for changing are not shown in the tables because they are different in destination. When changing the data, copy the data built in the same model.
Note: If copy the data built in the different model, the camcorder may not operate.
5) When changing the data, press the PAUSE button of the adjustment remote commander each time when setting new data to write the data in the non-volatile memory.
6) Check that the data of adjustment addresses is the initial value. If not, change the data to the initial value.

Processing after Completing Modification of E, F, 1E, 1F Page data

Order	Page	Address	Data	Procedure
1	0	10	00	Set the data.
2	2	00	29	Set the data.
3	2	01	29	Set the data, and press PAUSE button.
4				Perform "54MHz/66MHz Origin Osc. Adjustment" of the camera system adjustment.

3. E Page Table

Note1: The data of page: 0, address: 10 must be "00".

Note2: Fixed data-1: Initialized data. (Refer to "1. Initializing the E, F, 1E, 1F Page Data".)
Fixed data-2: Modified data. (Refer to "2. Modification of E, F, 1E, 1F Page Data").

Address	Remark
00 to 07	Fixed data-1
08	Fixed data-2
09	
0A to 0C	Fixed data-1
0D	Fixed data-2
0E	
0F to 10	Fixed data-1
11	Fixed data-2
12 to 18	Fixed data-1
19	Fixed data-2
1A	Fixed data-1
1B	Fixed data-2
1C	Fixed data-1
1D	Fixed data-2
1E to 1F	Fixed data-1
20	Fixed data-2 (Modified data. Copy the data built in the same model.)
21	
22	
23	
24 to 45	Fixed data-1
46	Fixed data-2
47	
48 to 53	Fixed data-1
54	Fixed data-2
55	
56 to 5A	Fixed data-1
5B	Fixed data-2
5C to 65	Fixed data-1
66	Fixed data-2 (Modified data. Copy the data built in the same model.)
67	
68	
69	
6A to 6E	Fixed data-1
6F	Fixed data-2 (Modified data. Copy the data built in the same model.)
70	
71	
72 to B1	Fixed data-1
B2	Fixed data-2
B3 to BC	Fixed data-1
BD	Fixed data-2
BE to ED	Fixed data-1
EE	Fixed data-2
EF	Fixed data-1
F0	Fixed data-2 (Modified data. Copy the data built in the same model.)
F1	
F2	
F3	
F4	Fixed data-1
F5	Fixed data-2
F6	Fixed data-1
F7	Fixed data-2 (Modified data. Copy the data built in the same model.)
F8	
F9	
FA to FE	Fixed data-1
FD	Fixed data-2
FE to FF	Fixed data-1

Table. 6-1-10.

4. F Page Table

Note1: The data of page: 0, address: 10 must be "00".

Note2: Fixed data-1: Initialized data. (Refer to "1. Initializing the E, F, 1E, 1F Page Data".)
Fixed data-2: Modified data. (Refer to "2. Modification of E, F, 1E, 1F Page Data").

Address	Initial value		Remark
	NTSC	PAL	
00 to FF			
10	40	40	54MHz/66MHz origin osc. adj.
11 to 12			Fixed data-1
13	28	28	HALL adj.
14	70	70	
15	88	88	
16	40	40	
17	80	80	
18	88	88	
19	A0	A0	MAX GAIN adj.
1A	59	59	LV standard data input
1B	9E	9E	
1C to 2D			Fixed data-1
2E	28	2B	AWB standard data input
2F	CF	26	
30	07	08	
31	E6	8A	
32	19	1B	Auto white balance adj.
33	DA	3C	
34	0D	0E	
35	AD	6D	
36			Fixed data-1
37	45	48	Color reproduction adj.
38			Fixed data-1
39	2C	2E	Color reproduction adj.
3A to 3F			Fixed data-1
40	FF	FE	Color reproduction adj.
41	E7	E1	
42 to 44			Fixed data-1
45			Fixed data-2
46			Fixed data-1
47			Fixed data-2
48	3F	3F	Flange back adj.
49	10	10	
4A	39	39	
4B	C2	C2	
4C	1E	1E	
4D	2E	2E	
4E	00	00	
4F	00	00	
50	00	00	
51	00	00	
52	6E	6E	
53	19	19	
54	00	00	
55	48	48	
56	00	00	
57	00	00	
58	00	00	
59			Fixed data-1
5A	80	80	MR adj.
5B	80	80	
5C	80	80	
5D	80	80	
5E	40	40	
5F	C0	C0	
60	40	40	
61	C0	C0	
62	40	40	
63	C0	C0	
64	40	40	
65	C0	C0	
66 to 71			Fixed data-1
72			Fixed data-2
73			
74 to 75			Fixed data-1
76	40	40	Mechanical shutter adj.
77	00	00	
78	34	34	
79	00	00	
7A	30	30	
7B	00	00	
7C	2A	2A	
7D	00	00	
7E	1C	17	
7F	00	00	
80	40	40	
81	3A	3A	
82	31	31	
83	31	31	
84	35	35	
85	1E	1E	
86	80	80	
87	80	80	
88	80	80	
89	80	80	
8A	80	80	
8B	80	80	
8C to 91			Fixed data-1
92	19	19	Hall adj.
93 to 97			Fixed data-1
98			Fixed data-2
99			Fixed data-1
9A			Fixed data-2
9B			(Modified data. Copy the data
9C			built in the same model.)
9D to A5			Fixed data-1
A6			Fixed data-2
A7 to AA			Fixed data-1
AB			Fixed data-2
AC to AF			Fixed data-1
B0			Fixed data-2
B1 to CC			Fixed data-1

F Page

Address	Initial value		Remark
	NTSC	PAL	
CD			Fixed data-2
CE			
CF			Fixed data-1
D0			Fixed data-2
D1 to F8			Fixed data-1
F9			Fixed data-2
FA			(Modified data. Copy the data
FB			built in the same model.)
FC to FF			Fixed data-1

Table. 6-1-11.

5. 1E Page Table

Note1: When reading or writing the 1E page data, select page: 0, address: 10, and set data: 01, then select E page. The 1E page can be chosen by this data setting.
After reading or writing, reset the data of page: 0, address: 10 to "00".

Note2: Fixed data-1: Initialized data. (Refer to "1. Initializing the E, F, 1E, 1F Page Data".)
Fixed data-2: Modified data. (Refer to "2. Modification of E, F, 1E, 1F Page Data").

Address	Remark
00 to C4	Fixed data-1
C5	Fixed data-2
C6	Fixed data-1
C7	Fixed data-2
C8	Fixed data-1
C9	Fixed data-2
CA	(Modified data. Copy the data
CB	built in the same model.)
CC	
CD	
CE	
CF	Fixed data-1
D0	Fixed data-2
D1	
D2 to D7	Fixed data-1
D8	Fixed data-2
D9	(Modified data. Copy the data
DA	built in the same model.)
DB	
DC to FF	Fixed data-1

Table. 6-1-12.

6. 1F Page Table

Note1: When reading or writing the 1F page data, select page: 0, address: 10, and set data: 01, then select F page. The 1F page can be chosen by this data setting.
After reading or writing, reset the data of page: 0, address: 10 to "00".

Note2: Fixed data-1: Initialized data. (Refer to "1. Initializing the E, F, 1E, 1F Page Data".)
Fixed data-2: Modified data. (Refer to "2. Modification of E, F, 1E, 1F Page Data").

Address	Remark
00	Fixed data-2
00 to AB	Fixed data-1
AC	Fixed data-2
AD	
AE	Fixed data-1
AF	Fixed data-2
B0	(Modified data. Copy the data
B1	built in the same model.)
B2	
B3	Fixed data-1
B4	Fixed data-2
B5 to B7	Fixed data-1
B8	Fixed data-2
B9	(Modified data. Copy the data
BA	built in the same model.)
BB to BD	Fixed data-1
BE	Fixed data-2
BF	
C0 to C9	Fixed data-1
CA	Fixed data-2
CB	(Modified data. Copy the data
CC	built in the same model.)
CD	
CE	
CF to D6	Fixed data-1
D7	Fixed data-2
D8 to DC	Fixed data-1
DD	Fixed data-2
DE	
DF to F2	Fixed data-1
F3	Fixed data-2
F4 to FF	Fixed data-1

Table. 6-1-13.

COVER

1-3. CAMERA SYSTEM ADJUSTMENTS

Before perform the camera system adjustments (except for "54MHz/66MHz Origin Oscillation Adjustment"), check that the specified values of "VIDEO SYSTEM ADJUSTMENTS" are satisfied.
And check that the data of page: 0, address: 10 is "00". If not, set data: 00 to this address.

1. 54MHz/66MHz Origin Oscillation Adjustment (VC-315 board)

Set the frequency of the clock for synchronization.
If deviated, the synchronization will be disrupted and the color will become inconsistent.

Subject	Not required
Measurement Point	Pin ⑯ of IC1503 Or Pin ⑱ of IC2101 (R2132)
Measuring Instrument	Frequency counter
Adjustment Page	F
Adjustment Address	10
Specified Value	Pin ⑯ of IC1503 f=33000000 ± 165Hz (NTSC) f=27000000 ± 136Hz (PAL) Pin ⑱ of IC2101 (R2132) f=13500000 ± 68Hz

Note1: The data of page: 0, address: 10 must be "00".
Note2: When open the DI-089 board, use the following extension cable between the VC-315 board CN1003 and DI-089 board CN4004.
J-6082-352-A (100P, 0.5mm)
Note3: NTSC model: DCR-TRV38/TRV39
PAL model: DCR-TRV38E

Adjusting method:

Order	Page	Address	Data	Procedure
1	0	01	01	Set the data.
2	F	10		Change the data and set the frequency (f) to the specified value.
3	F	10		Press PAUSE button.
4	0	01	00	Set the data.

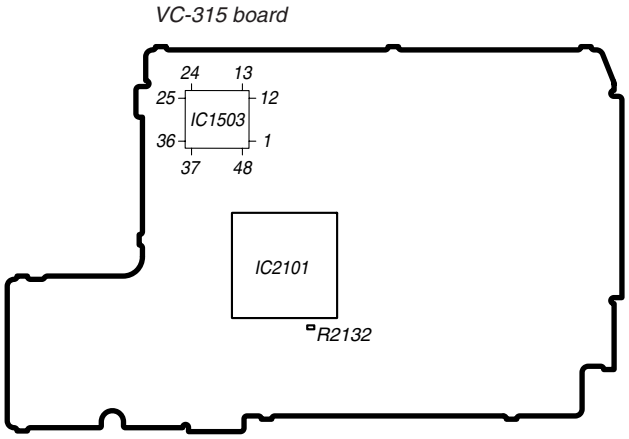


Fig. 6-1-7.

2. HALL Adjustment RadarW

For detecting the position of the lens iris and ND filter, adjust AMP gain and offset.

Subject	Not required
Measurement Point	Display data of page 1 (Note1)
Measuring Instrument	Adjustment remote commander
Adjustment Page	F
Adjustment Address	13 to 18, 92
Specified Value 1	D4 to DC
Specified Value 2	24 to 2C
Specified Value 3	D2 to DE
Specified Value 4	22 to 2E

Note1: Displayed data of page 1 of the adjustment remote commander.
1 : XX : XX
XX — IRIS display data
XX — ND display data
Note2: The data of page: 0, address: 10 must be "00".

Switch setting:
POWER ..... CAMERA

Adjusting method:

Order	Page	Address	Data	Procedure
1	0	01	01	Set the data.
2	6	01	6D	Set the data, and press PAUSE button.
3	6	02		Check that the data changes to "01". (Note3)
4	6	01	00	Set the data, and press PAUSE button.

Note3: The adjustment data will be automatically input to page: F, address: 13 to 18, 92.

Checking method:

Order	Page	Address	Data	Procedure
1	0	03	03	Set the data.
2	6	01	01	Set the data, and press PAUSE button.
3	6	01	03	Set the data, and press PAUSE button.
4	1			Check that the IRIS display data (Note1) satisfies the specified value1.
5	6	01	01	Set the data, and press PAUSE button.
6	1			Check that the IRIS display data (Note1) satisfies the specified value2.
7	6	01	6B	Set the data, and press PAUSE button.
8	6	01	69	Set the data, and press PAUSE button.
9	1			Check that the ND display data (Note1) satisfies the specified value3.
10	6	01	6B	Set the data, and press PAUSE button.
11	1			Check that the ND display data (Note1) satisfies the specified value4.

Processing after Completing Adjustments:

Order	Page	Address	Data	Procedure
1	6	01	00	Set the data, and press PAUSE button.
2	0	03	00	Set the data.
3	0	01	00	Set the data.

3. MR Adjustment RadarW

The MR (Magnet resistor) adjustment of the inner focus lens is carried out automatically. In whichever case, the focus will be deviated during auto focusing/manual focusing.

Subject	Not required
Measurement Point	Adjustment remote commander
Measuring Instrument	
Adjustment Page	F
Adjustment Address	58, 5A to 65
Specified Value1	40 to C0
Specified Value2	03 to 78
Specified Value3	88 to FD

Note1: Make the lens horizontal and perform this adjustment.
Note2: Perform this adjustment before "Flange Back Adjustment".
Note3: The data of page: 0, address: 10 must be "00".
Note4: Check that the data of page: 6, address: 02 is "00". If not, to page: 6, address: 01, set data: 00, and press the PAUSE button.

Switch setting:

1) POWER ..... CAMERA

Adjusting method:

Order	Page	Address	Data	Procedure
1	0	01	01	Set the data.
2	6	01	BD	Set the data, and press PAUSE button.
3	6	02		Check that the data changes to "01". (Note5)
4	F	5A		Check that the data satisfies the specified value 1.
5	F	5B		Check that the data satisfies the specified value 1.
6	F	5C		Check that the data satisfies the specified value 1.
7	F	5D		Check that the data satisfies the specified value 1.
8	F	5E		Check that the data satisfies the specified value 2.
9	F	5F		Check that the data satisfies the specified value 3.
10	F	60		Check that the data satisfies the specified value 2.
11	F	61		Check that the data satisfies the specified value 3.
12	F	62		Check that the data satisfies the specified value 2.
13	F	63		Check that the data satisfies the specified value 3.
14	F	64		Check that the data satisfies the specified value 2.
15	F	65		Check that the data satisfies the specified value 3.

Note5: The adjustment data will be automatically input to page: F, address: 58, 5A to 65.

Processing after Completing Adjustments:

Order	Page	Address	Data	Procedure
1	6	01	00	Set the data, and press PAUSE button.
2	0	01	00	Set the data.
3				Turn off the power and turn on again

4. Flange Back Adjustment (Using Minipattern Box) RadarW

The inner focus lens flange back adjustment is carried out automatically. In whichever case, the focus will be deviated during auto focusing/manual focusing.

Subject	Siemens star chart with ND filter for the minipattern box (Note1)
Measurement Point	Adjustment remote commander
Measuring Instrument	
Adjustment Page	F
Adjustment Address	48 to 58
Specified Value	Data of page: F, address: 57 is “00” to “0B”.

Note1: Dark Siemens star chart.
Note2: This adjustment should be carried out upon completion of the following adjustments.
“HALL Adjustment”, “MR Adjustment”
Note3: Make the lens horizontal and perform this adjustment.
Note4: The data of page: 0, address: 10 must be “00”.
Note5: Check that the data of page: 6, address: 02 is “00”. If not, turn off the power and turn on again.

Switch setting:

1) POWER ..... CAMERA
2) NIGHT SHOT ..... OFF
3) COLOR SLOW SHUTTER (Function setting) ..... OFF

Preparations:

1) The minipattern box is installed as shown in the following figure.
Note: The attachment lenses are not used.
2) Install the minipattern box so that the distance between it and the front of the lens of the camcorder is less than 3cm.
3) Make the height of the minipattern box and the camcorder equal.
4) Check that the output voltage of the regulated power supply is the specified voltage.
5) Check that at both the zoom lens TELE end and WIDE end, the center of the Siemens star chart and center of the exposure screen coincide.

Specified voltage: The specified voltage varies according to the minipattern box, so adjust the power supply output voltage to the specified voltage written on the sheet which is supplied with the minipattern box.

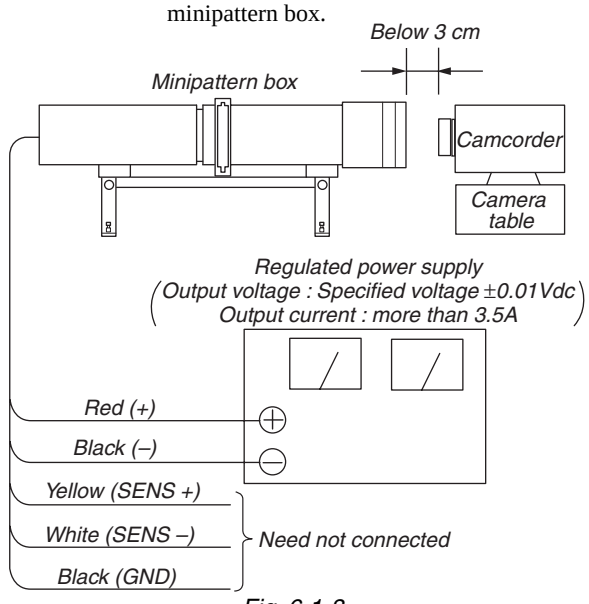


Fig. 6-1-8.

Adjusting method:

Order	Page	Address	Data	Procedure
1	0	01	01	Set the data.
2	6	01	13	Set the data, and press PAUSE button.
3	6	01	27	Set the data, and press PAUSE button.
4	6	02		Check that the data changes to “01”. (Note6)
5	F	57		Check the data is “00” to “0B”.

Note6: The adjustment data will be automatically input to page: F, address: 48 to 58.

Processing after Completing Adjustments:

Order	Page	Address	Data	Procedure
1	6	01	00	Set the data, and press PAUSE button.
2	6	01	25	Set the data, and press PAUSE button.
3	6	01	00	Set the data, and press PAUSE button.
4	0	01	00	Set the data.
5				Perform “Flange Back Check”.

5. Flange Back Adjustment (Using Flange Back Adjustment Chart and Subject More Than 500m Away)

The inner focus lens flange back adjustment is carried out automatically. In whichever case, the focus will be deviated during auto focusing/manual focusing.

5-1. Flange Back Adjustment (1) RadarW

Subject	Flange back adjustment chart (2.0 m from the front of the protection glass) (Luminance: 350 ± 50 lux)
Measurement Point	Adjustment remote commander
Measuring Instrument	
Adjustment Page	F
Adjustment Address	48 to 58
Specified Value	Data of page: F, address: 57 is “00” to “0B”.

Note1: This adjustment should be carried out upon completion of the following adjustments.
“HALL Adjustment”, “MR Adjustment”
Note2: Make the lens horizontal and perform this adjustment.
Note3: The data of page: 0, address: 10 must be “00”.
Note4: Check that the data of page: 6, address: 02 is “00”. If not, turn off the power and turn on again.

Switch setting:

1) POWER ..... CAMERA
2) NIGHT SHOT ..... OFF
3) COLOR SLOW SHUTTER (Function setting) ..... OFF

Preparations:

1) Check that at both the zoom lens TELE end and WIDE end, the center of the chart for the flange back adjustment and center of the exposure screen coincide.

Adjusting method:

Order	Page	Address	Data	Procedure
1	0	01	01	Set the data.
2	6	01	13	Set the data, and press PAUSE button.
3	6	01	15	Set the data, and press PAUSE button.
4	6	02		Check that the data changes to “01”. (Note5)
5	F	57		Check the data is “00” to “0B”.

Note5: The adjustment data will be automatically input to page: F, address: 48 to 58.

Processing after Completing Adjustments:

Order	Page	Address	Data	Procedure
1	6	01	00	Set the data, and press PAUSE button.
2	6	01	25	Set the data, and press PAUSE button.
3	6	01	00	Set the data, and press PAUSE button.
4	0	01	00	Set the data.
5				Perform “Flange Back Adjustment (2)”

5-2. Flange Back Adjustment (2) RadarW

Perform this adjustment after performing “Flange Back Adjustment (1)”.

Subject	Subject more than 500m away (Subjects with clear contrast such as buildings, etc.)
Measurement Point	Check operation on TV monitor
Measuring Instrument	
Adjustment Page	F
Adjustment Address	48 to 58

Note1: Make the lens horizontal and perform this adjustment.
Note2: The data of page: 0, address: 10 must be “00”.
Note3: Check that the data of page: 6, address: 02 is “00”. If not, turn off the power and turn on again.

Switch setting:

1) POWER ..... CAMERA
2) NIGHT SHOT ..... OFF
3) COLOR SLOW SHUTTER (Function setting) ..... OFF

Preparations:

1) Set the zoom lens to the TELE end and expose a subject that is more than 500m away (subject with clear contrast such as building, etc.). (Nearby subjects less than 500m away should not be in the screen.)

Adjusting method:

Order	Page	Address	Data	Procedure
1	0	01	01	Set the data.
2	6	01	13	Set the data, and press PAUSE button.
3				Place a ND filter on the lens so that the optimum image is obtain.
4	6	01	29	Set the data, and press PAUSE button.
5	6	02		Check that the data changes to “01”. (Note4)

Note4: The adjustment data will be automatically input to page: F, address: 48 to 58.

Processing after Completing Adjustments:

Order	Page	Address	Data	Procedure
1	6	01	00	Set the data, and press PAUSE button.
2	6	01	25	Set the data, and press PAUSE button.
3	6	01	00	Set the data, and press PAUSE button.
4	0	01	00	Set the data.
5				Perform “Flange Back Check”

6. Flange Back Check

Subject	Siemens star (2.0m from the front of the lens) (Luminance : approx. 200 lux)
Measurement Point	Check operation on TV monitor
Measuring Instrument	
Specified Value	Focused at the TELE end and WIDE end.

Note1: The data of page: 0, address: 10 must be "00".

Switch setting:

1) POWER ..... CAMERA
2) NIGHT SHOT ..... OFF

Note2: When the auto focus is ON, the lens can be checked if it is focused or not by observing the data on the page 1 of the adjustment remote commander.
1) Select page: 0, address: 03, and set data: 0F.
2) Page 1 shows the state of the focus.
1 : 00 : XX
Odd: Focused
Even: Unfocused

Checking method:

1) Select page: 6, address: 40, and set data: 01.
2) Select page: 6, address: 41, and set data: 01.
3) Place the Siemens star 2.0m from the front of the lens.
4) To open the IRIS, decrease the luminous intensity to the Siemens star up to a point before noise appear on the image.
5) Shoot the Siemens star with the zoom TELE end.
6) Turn on the auto focus.
7) Check that the lens is focused (Note2).
8) Select page: 6, address: 21, and set data: 10.
9) Shoot the Siemens star with the zoom WIDE end.
10) Observe the TV monitor and check that the lens is focused.

Processing after Completing Adjustments:

1) Select page: 6, address: 21, and set data: 00.
2) Select page: 6, address: 40, and set data: 00.
3) Select page: 6, address: 41, and set data: 00.
4) Select page: 0, address: 03, and set data: 00.

7. MAX GAIN Adjustment RadarW

Setting the minimum illumination.
If it is not consistent, the image level required for taking subjects in low illuminance will not be produced (dark).

Subject	Clear chart (Approx. 1m from the front of the lens) Note1
Adjustment Page	F
Adjustment Address	19

Note1: Shoot the clear chart with the zoom WIDE end. And adjust the direction of the camera so that the chart is located in the center of the screen.
Note2: The data of page: 0, address: 10 must be "00".
Note3: This adjustment should be carried out upon completion of "Flange Back Adjustment".
Note4: NTSC model: DCR-TRV38/TRV39
PAL model: DCR-TRV38E

Switch setting:

1) POWER ..... CAMERA
2) NIGHT SHOT ..... OFF
3) ZOOM ..... WIDE end
4) DIGITAL ZOOM (Menu setting) ..... OFF

Adjusting method:

Order	Page	Address	Data	Procedure
1	0	01	01	Set the data.
2	6	2C	01	Set the data.
3	6	40	01	Set the data.
4	6	96		Set the following data. 33 (NTSC), 1F (PAL)
5	6	97	00	Set the data.
6	6	01	6F	Set the data, and press PAUSE button.
7	6	02		Check that the data changes to "01". (Note5)

Note5: The adjustment data will be automatically input to page: F, address: 19.

Processing after Completing Adjustments

Order	Page	Address	Data	Procedure
1	6	2C	00	Set the data.
2	6	40	00	Set the data.
3	6	96	00	Set the data.
4	6	97	00	Set the data.
5	6	01	00	Set the data, and press PAUSE button.
6	0	01	00	Set the data.

8. Picture Frame Setting (Color Reproduction Adjustment Frame)

When performing “Color Reproduction Adjustment” and “LV Standard Data Input”, set the picture frame to “Color reproduction adjustment frame”.

Subject

Color bar chart	(Color reproduction adjustment frame) (1.5m from the front of the lens)
Measurement Point	Video terminal of AUDIO/VIDEO jack
Measuring Instrument	Oscilloscope, TV monitor (Under scan mode)
Specified Value	A=B, C=D, E=F

Note1: The following adjustments should be carried out upon completion of “Flange Back Adjustment”.

Note2: The data of page: 0, address: 10 must be “00”.

Switch setting:

1) POWER ..... CAMERA
2) NIGHT SHOT ..... OFF
3) FOCUS ..... MANUAL
4) DIGITAL ZOOM (Menu setting) ..... OFF
5) STEADY SHOT (Menu setting) ..... OFF

Setting method:

1) Adjust the zoom and the camera direction, and set to the specified position.
2) Mark the position of the picture frame on the monitor display, and adjust the picture frame to this position in following adjustments using “Color reproduction adjustment frame”.

Check on the oscilloscope

1. Horizontal period

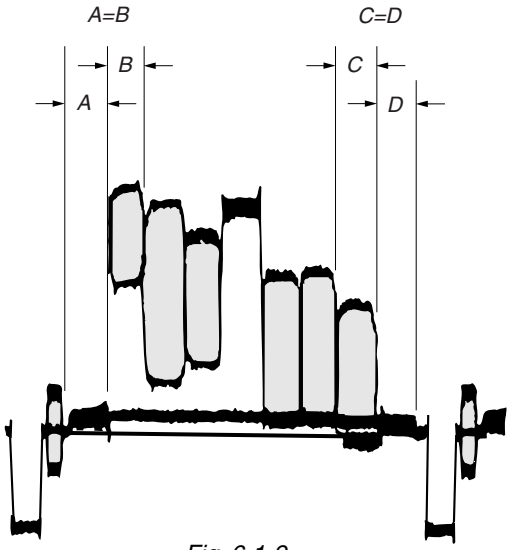


Fig. 6-1-9.

2. Vertical period

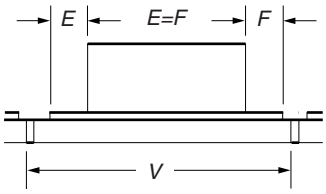


Fig. 6-1-10.

Check on the monitor TV (Underscanned mode)

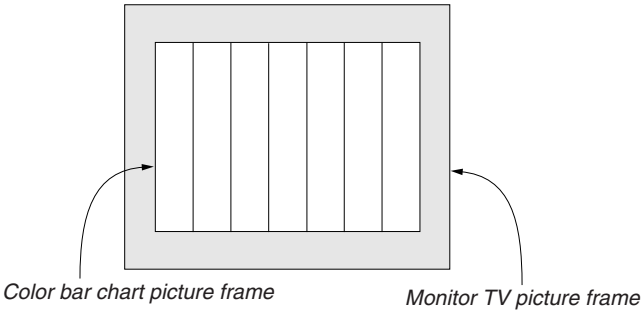


Fig. 6-1-11.

9. Color Reproduction Adjustment

Adjust the color Separation matrix coefficient so that proper color reproduction is produced.

Subject	Color bar chart (Color reproduction adjustment frame)
Measurement Point	Video terminal of AUDIO/VIDEO jack
Measuring Instrument	Vectorscope
Adjustment Page	F
Adjustment Address	37, 39, 40, 41
Specified Value	All color luminance points should settle within each color reproduction frame.

Note1: The data of page: 0, address: 10 must be "00".
Note2: NTSC model: DCR-TRV38/TRV39
PAL model: DCR-TRV38E

Switch setting:

1) POWER ..... CAMERA
2) NIGHT SHOT ..... OFF
3) FOCUS ..... MANUAL
4) DIGITAL ZOOM (Menu setting) ..... OFF
5) STEADY SHOT (Menu setting) ..... OFF

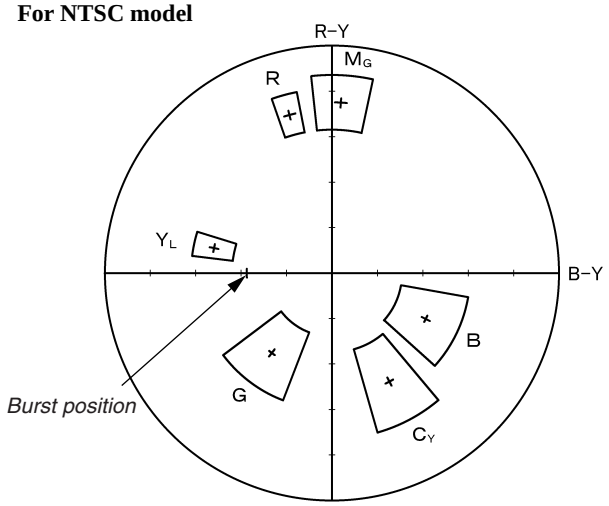
Adjusting method:

1) Select page: 0, address: 01, and set data: 01.
2) Select page: 6, address: 9D, and set data: 19.
3) Select page: 6, address: 01, set data: 3D, and press the PAUSE button.
4) Select page: F, address: F0, set the following data, and press the PAUSE button.
   37 (NTSC), B7 (PAL)
5) Adjust the GAIN and PHASE of the vectorscope, and adjust the burst luminance point to the burst position of the color reproduction frame.
6) Change the data of page: F, address: 37, 39, 40 and 41, and settle each color luminance point in each color reproduction frame.
   Note: Be sure to press the PAUSE button of the adjustment remote commander before changing the addresses. If not, the new data will not be written to the memory.

Processing after Completing Adjustments:

1) Select page: 6, address: 01, set data: 00, and press the PAUSE button.
2) Select page: 6, address: 9D, and set data: 00.
3) Select page: 0, address: 01, and set data: 00.

For NTSC model



For PAL model

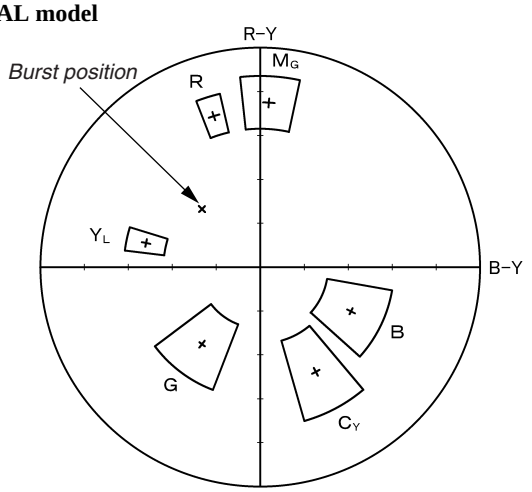


Fig. 6-1-12.

10. LV Standard Data Input RadarW

Adjust the normal coefficient of the light value.

Subject	Clear chart (Color reproduction adjustment frame)
Measurement Point	Display data of page 1 (Note5)
Measuring Instrument	Adjustment remote commander
Adjustment Page	F
Adjustment Address	1A, 1B
Specified Value	0FE0 to 1020

Note1: This adjustment should be carried out upon completion of "Color Reproduction Adjustment".

Note2: After the power is turned on, this adjustment can be done only once.

Note3: The data of page: 0, address: 10 must be "00".

Note4: Check that the data of page: 6, address: 02 is "00". If not, turn off the power and turn on again.

Note5: Displayed data of page 1 of the adjustment remote commander.

1 : XX : XX
└──── Display data

Switch setting:

1) POWER ..... CAMERA
2) NIGHT SHOT ..... OFF
3) FOCUS ..... MANUAL
4) DIGITAL ZOOM (Menu setting) ..... OFF

Adjusting method:

Order	Page	Address	Data	Procedure
1	0	01	01	Set the data.
2				Wait for more than 6 sec.
3	6	40	01	Set the data, and press PAUSE button.
4	6	01	0D	Set the data, and press PAUSE button.
5	6	02		Check that the data changes to "01". (Note6)
6	0	03	1E	Set the data.
7	1			Check that the display data (Note5) satisfies the specified value.

Note6: The adjustment data will be automatically input to page: F, address: 1A, 1B.

Processing after Completing Adjustments

Order	Page	Address	Data	Procedure
1	6	01	00	Set the data, and press PAUSE button.
2	6	40	00	Set the data.
3	0	03	00	Set the data.
4	0	01	00	Set the data.

11. Picture Frame Setting (All White Frame) RadarW

When performing "Auto White Balance Standard Data Input", "Auto White Balance Adjustment" and "White Balance Check", set the picture frame to "All white frame".

Subject	Clear chart (All white frame) (1.5m from the front of the lens)
Measurement Point	Video terminal of AUDIO/VIDEO jack
Measuring Instrument	TV monitor (Under scan mode)
Specified Value	Whole of the screen is white

Note: The data of page: 0, address: 10 must be "00".

Switch setting:

1) POWER ..... CAMERA
2) NIGHT SHOT ..... OFF
3) FOCUS ..... MANUAL
4) DIGITAL ZOOM (Menu setting) ..... OFF
5) STEADY SHOT (Menu setting) ..... OFF

Setting method:

Order	Page	Address	Data	Procedure
1	6	90	DE	Set the data.
2	6	91	02	Set the data.
3	6	92	80	Set the data.
4	6	93	33	Set the data.
5	6	01	79	Set the data, and press PAUSE button.
6				Check that the whole of the screen is white.
7				Perform the following adjustments.

Processing after Completing Adjustments

After completing "Auto White Balance Standard Data Input", "Auto White Balance Adjustment" and "White Balance Check", release the data setting.

Order	Page	Address	Data	Procedure
1	6	90	00	Set the data.
2	6	91	00	Set the data.
3	6	92	00	Set the data.
4	6	93	00	Set the data.

12. Auto White Balance Standard Data Input RadarW

Adjust the white balance reference at 3200K.

Subject	Clear chart (All white frame) (Note4)
Adjustment Page	F
Adjustment Address	2E to 31

Note1: This adjustment should be carried out upon completion of "Color Reproduction Adjustment".
Note2: The data of page: 0, address: 10 must be "00".
Note3: Check that the data of page: 6, address: 02 is "00". If not, to page: 6, address: 01, set data: 00, and press the PAUSE button.
Note4: Perform "11. Picture Frame Setting (All White Frame)" before this adjustment.

Switch setting:

1) POWER ..... CAMERA
2) NIGHT SHOT ..... OFF
3) FOCUS ..... MANUAL
4) DIGITAL ZOOM (Menu setting) ..... OFF
5) STEADY SHOT (Menu setting) ..... OFF

Adjusting method:

Order	Page	Address	Data	Procedure
1				Check that the whole of the screen is white. If not, perform "11. Picture Frame Setting (All White Frame)".
2	0	01	01	Set the data.
3				Wait for more than 2 sec.
4	6	01	11	Set the data, and press PAUSE button.
5	6	01	0B	Set the data, and press PAUSE button.
6	6	02		Check that the data changes to "01". (Note5)
7				Perform "Auto White Balance Adjustment".

Note5: The adjustment data will be automatically input to page: F, address: 2E to 31.

13. Auto White Balance Adjustment RadarW

Adjust to the proper auto white balance output data.
If it is not correct, auto white balance and color reproducibility will be poor.

Subject	Clear chart (All white frame)
Filter	Filter C14 for color temperature correction
Measurement Point	Display data of page 1 (Note3)
Measuring Instrument	Adjustment remote commander
Adjustment Page	F
Adjustment Address	32 to 35
Specified Value	R ratio: 2C60 to 2CE0 B ratio: 5A50 to 5B00

Note1: This adjustment should be carried out upon completion of "Auto White Balance Standard Data Input".
Note2: The data of page: 0, address: 10 must be "00".
Note3: Displayed data of page 1 of the adjustment remote commander.

1 : XX : XX
└── Display data

Switch setting:

1) POWER ..... CAMERA
2) NIGHT SHOT ..... OFF
3) FOCUS ..... MANUAL
4) DIGITAL ZOOM (Menu setting) ..... OFF
5) STEADY SHOT (Menu setting) ..... OFF

Adjusting method:

Order	Page	Address	Data	Procedure
1				Check that the whole of the screen is white. If not, perform "11. Picture Frame Setting (All White Frame)".
2				Place the C14 filter for color temperature correction on the lens.
3	0	01	01	Set the data.
4	F	44		Write down the data.
5	F	44	2C	Set the data, and press PAUSE button.
6	F	45		Write down the data.
7	F	45	A0	Set the data, and press PAUSE button.
8	F	46		Write down the data.
9	F	46	5A	Set the data, and press PAUSE button.
10	F	47		Write down the data.
11	F	47	90	Set the data, and press PAUSE button.
12	6	01	83	Set the data, and press PAUSE button.
13	6	01	81	Set the data, and press PAUSE button.
14	6	02		Check that the data changes to "01". (Note4)
15	6	01	3F	Set the data, and press PAUSE button.
16	0	03	04	Set the data.
17	1			Check that the display data (Note3) satisfies the R ratio specified value.
18	0	03	05	Set the data.
19	1			Check that the display data (Note3) satisfies the B ratio specified value.

Note4: The adjustment data will be automatically input to page: F, address: 32 to 35.

Processing after Completing Adjustments:

Order	Page	Address	Data	Procedure
1	F	44		Set the data that is written down at step 4, and press PAUE button.
2	F	45		Set the data that is written down at step 6, and press PAUE button.
3	F	46		Set the data that is written down at step 8, and press PAUE button.
4	F	47		Set the data that is written down at step 10, and press PAUE button.
5	0	01	00	Set the data.
6	0	03	00	Set the data.
7				Perform "White Balance Check".

14. White Balance Check RadarW

Subject	Clear chart (All white frame) (Note2)
Filter	Filter C14 for color temperature correction ND filter 1.0 and 0.4 and 0.1
Measurement Point	Video terminal of AUDIO/VIDEO jack
Measuring Instrument	Vectorscope
Specified Value	Fig. 6-1-13. A to B

Note1: The data of page: 0, address: 10 must be "00".
Note2: Perform "11. Picture Frame Setting (All White Frame)".

Switch setting:

1) POWER ..... CAMERA
2) NIGHT SHOT ..... OFF
3) FOCUS ..... MANUAL
4) DIGITAL ZOOM (Menu setting) ..... OFF
5) STEADY SHOT (Menu setting) ..... OFF

Checking method:

Order	Page	Address	Data	Procedure
				Indoor white balance check
1				Check that the lens is not covered with either filter.
2	6	01	0F	Set the data, and press PAUSE button.
3				Check that the center of the white luminance point is within the circle shown Fig. 6-1-13. A.
4	6	01	00	Set the data, and press PAUSE button.
				Outdoor white balance check
5				Place the C14 filter on the lens.
6	6	01	3F	Set the data, and press PAUSE button.
7				Check that the center of the white luminance point is within the circle shown Fig. 6-1-13. B.
8				Remove the C14 filter.
				LV data check
9				Place the ND filter 1.5 (1.0+0.1+0.4) on the lens.
10	6	01	00	Set the data, and press PAUSE button.
11	0	03	06	Set the data.
12	1			Check that the display data (Note2) satisfies the specified value. Specified value: 8000 to 8BC0

Note2: Displayed data of the adjustment remote commander.
1 : XX : XX
└──── Display data

Processing after Completing Adjustments

Order	Page	Address	Data	Procedure
1	6	01	00	Set the data, and press PAUSE button.
2	6	90	00	Set the data.
3	6	91	00	Set the data.
4	6	92	00	Set the data.
5	6	93	00	Set the data.
6	0	03	00	Set the data.

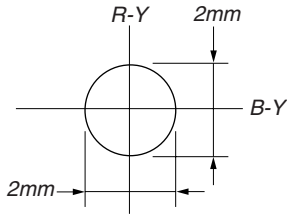


Fig. 6-1-13(A).

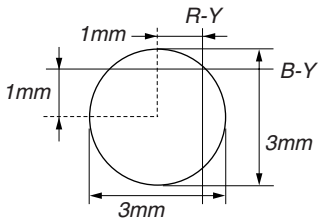


Fig. 6-1-13(B).

15. Mechanical Shutter Adjustment RadarW

Adjustment Page	F
Adjustment Address	76 to 8B

Note: The data of page: 0, address: 10 must be “00”.

Adjusting method:

1) Select page: 0, address: 01, and set data: 01.
2) Input the following data to page: F, addresses: 76 to 8B.
   Note: Press the PAUSE button of the adjustment remote commander each time to set the data.

Address	Data	
	NTSC	PAL
76	66	53
77	80	98
78	50	41
79	78	76
7A	45	38
7B	85	84
7C	3C	31
7D	7D	85
7E	32	28
7F	85	85
80	6D	6C
81	7A	7B
82	7D	7E
83	6F	70
84	63	63
85	1E	1E
86	75	77
87	80	80
88	80	80
89	80	80
8A	80	80
8B	75	76

3) Select page: 0, address: 01, and set data: 00.

16. Steady Shot Check RadarW

Precautions on the Parts Replacement

There are two types of repair parts.

Type A :ENC03LA
Type B :ENC03LB

Replace the broken sensor with a same type sensor. If replace with other type parts, the image will vibrate up and down or left and right during hand-shake correction operations.

Precautions on Angular Velocity Sensor

The sensor incorporates a precision oscillator. Handle it with care as if it dropped, the balance of the oscillator will be disrupted and operations will not be performed properly.

Subject	Arbitrary
Measurement Point	Display data of page 1 (Note1)
Measuring Instrument	Adjustment remote commander
Specified Value	2B00 to 4B00

Note1: Displayed data of the adjustment remote commander.

1 : XX : XX
└──── Display data

Note2: The data of page: 0, address: 10 must be “00”.

Switch setting:

1) STEADY SHOT (Menu setting) ..... ON
2) ZOOM ..... TELE end

Adjusting method:

Order	Page	Address	Data	Procedure
				Pitch sensor check (JK-248 board SE5001)
1	0	03	11	Set the data.
2	1			Check that the display data (Note1) satisfies the specified value.
				Yaw sensor check (JK-248 board SE5002)
3	0	03	12	Set the data.
4	1			Check that the display data (Note1) satisfies the specified value.

Processing after Completing Adjustments

Order	Page	Address	Data	Procedure
1	0	03	00	Set the data.
2				Move the camcorder, and check that the steady shot operations have been performed normally

COVER

1-4. COLOR ELECTRONIC VIEWFINDER SYSTEM ADJUSTMENT

Note1: When replacing the LCD unit, be careful to prevent damages caused by static electricity.
Note2: Before performing the adjustments, check the data of page: 0, address: 10 is "00". If not, set data: 00 to this address.
Note3: As the PANEL CLOSE switch is attached to the cabinet (R), this cabinet must be attached when performing adjustments.
If you perform the adjustments with cabinet (R) removed, set the following data.
1) Select page: 3, address: C4, and set data: 67.
2) Select page: 3, address: C5, and set data: 01.
Reset the data after completing adjustment.
1) Select page: 3, address: C4, and set data: 00.
2) Select page: 3, address: C5, and set data: 00.
Note4: NTSC model: DCR-TRV38/TRV39
PAL model: DCR-TRV38E

[Adjusting connector]
Most of the measuring points for adjusting the viewfinder system are concentrated in CN1004 of VC-315 board.
Connect the Measuring Instruments via the CPC-7 jig (J-6082-382-A).
The following table shows the Pin No. and signal name of CN1004.

Pin No.	Signal Name	Pin No.	Signal Name
1	FRRV	9	PANEL VG
2	RF MON	10	GND
3	RF IN/LANC JACK IN	11	EVF VCO
4	SWP	12	GND
5	PANEL COM	13	EVF VG
6	GND	14	EXT DA
7	H START	15	N.C.
8	GND	16	N.C.

Table 6-1-14.

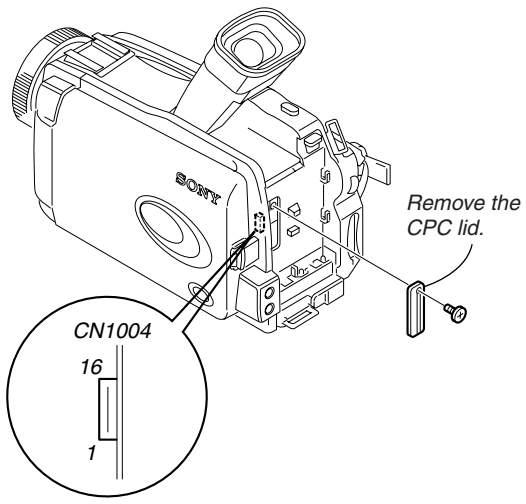


Fig. 6-1-14.

1. VCO Adjustment (DI-089 board)

Set the VCO free-run frequency. If deviated, the EVF screen will be blurred.

Note: Do either of the automatic adjustment or the manual adjustment.

1-1. Automatic Adjustment RadarW

Mode	Camera
Subject	Arbitrary
Measurement Point	Check on EVF screen
Measuring Instrument	
Adjustment Page	C
Adjustment Address	36, 37
Specified Value	The EVF screen should be stable.

Note1: The data of page: 0, address: 10 must be "00".

Adjusting method:

Order	Page	Address	Data	Procedure
1	0	01	01	Set the data.
2	C	36	87	Set the data, and press PAUSE button.
3	3	0C	20	Set the data, and press PAUSE button.
4	3	22	0F	Set the data, and press PAUSE button.
5				Check that the EVF screen turned white.
6	C	5A	73	Set the data, and press PAUSE button.
7	C	36		Read the data, and this data is named PRESET DATA.
8	C	36		Add 30 (Hexadecimal) to the data and press PAUSE button.
9	C	36		Check the EVF screen. When the screen is stable, proceed to step 13. When the screen is unstable, proceed to step 10.
10	C			Calculate D_{36} using following equation (Hexadecimal calculation). (Note2) D_{36} = PRESET DATA – 18
11	C	36	D_{36}	Set the data, and press PAUSE button.
12				Return to step 7.
13	C	36		Set the PRESET DATA and press PAUSE button.
14	C	36		Subtract 30 (Hexadecimal) from the data and press PAUSE button.
15	C	36		Check the EVF screen. When the screen is stable, proceed to step 19. When the screen is unstable, proceed to step 16.

Order	Page	Address	Data	Procedure
16				Calculate D_{36} using following equation (Hexadecimal calculation). (Note3) D_{36} = PRESET DATA + 18
17	C	36	D_{36}	Set the data, and press PAUSE button.
18				Return to step 7.
19	C	36		Set the PRESET DATA and press PAUSE button.
20	C	36		Read the data, and this data is named D_{36}.
21				Calculate D_{37} using following equation (Hexadecimal calculation). $D_{37} = D_{36} + 18$ (NTSC) (Note4) $D_{37} = D_{36} - 18$ (PAL) (Note5)
22	C	37	D_{37}	Set the data, and press PAUSE button.
23	C	5A	F3	Set the data, and press PAUSE button.
24	3	0C	00	Set the data, and press PAUSE button.
25	3	22	00	Set the data, and press PAUSE button.
26	0	01	00	Set the data.

Note2: When D_{36} become negative number, handle D_{36} as "00".
Note3: When D_{36} become above "FF", handle D_{36} as "FF".
Note4: When D_{37} become above "FF", handle D_{37} as "FF".
Note5: When D_{37} become negative number, handle D_{37} as "00".

1-2. Manual Adjustment

Mode	Camera
Subject	Arbitrary
Measurement Point	Pin ⑪ of CN1004 of VC-315 board (EVF VCO)
Measuring Instrument	Frequency counter
Adjustment Page	C
Adjustment Address	36, 37
Specified Value	f = 15734 ± 30Hz (NTSC) f = 15625 ± 30Hz (PAL)

Note1: The data of page: 0, address: 10 must be "00".

Adjusting method:

Order	Page	Address	Data	Procedure
1	0	01	01	Set the data.
2	C	36		Change the data and set the VCO frequency (f) to the specified value.
3	C	36		Press PAUSE button.
4	C	36		Read the data, and this data is named D_{36}.
5				Convert D_{36} to decimal notation, and obtain D_{36}'. (Note2)
6				Calculate D_{37}' using following equations (Decimal calculation) [NTSC model] When $D_{36}' \leqq 231$ $D_{37}'=D_{36}'+24$ When $D_{36}'>231$ $D_{37}'=255$ [PAL model] When $D_{36}' \geqq 24$ $D_{37}'=D_{36}'-24$ When $D_{36}' < 24$ $D_{37}'=0$
7				Convert D_{37}' to a hexadecimal number, and obtain D_{37}. (Note2)
8	C	37	D_{37}	Set the data, and press PAUSE button.
9	0	01	00	Set the data.

Note2: Refer to "Table 6-4-1. Hexadecimal-decimal Conversion Table".

2. RGB AMP Adjustment (DI-089 board)

Set the D range of the RGB decoder used to drive the LCD to the specified value. If deviated, the LCD screen will become blackish or saturated (whitish).

Note: Do either of the automatic adjustment or the manual adjustment.

2-1. Automatic Adjustment RadarW

Mode	Camera
Subject	Arbitrary
Adjustment Page	C
Adjustment Address	39

Note: The data of page: 0, address: 10 must be “00”.

Adjusting method:

Order	Page	Address	Data	Procedure
1	0	01	01	Set the data.
2	3	01	50	Set the data, and press PAUSE button.
3	3	02		Check that the data changes from “50” to “00”.
4	3	01	00	Set the data, and press PAUSE button.
5	0	01	00	Set the data.

2-2. Manual Adjustment

Mode	Camera
Subject	Arbitrary
Measurement Point	Pin ⑬ of CN1004 of VC-315 board (EVF VG)
Measuring Instrument	Oscilloscope
Adjustment Page	C
Adjustment Address	39
Specified Value	A = 7.00 ± 0.05V

Note: The data of page: 0, address: 10 must be “00”.

Adjusting method:

Order	Page	Address	Data	Procedure
1	0	01	01	Set the data.
2	C	39		Change the data and set the voltage (A) between the reversed waveform pedestal and non-reversed waveform pedestal to the specified value.
3	C	39		Press PAUSE button.
4	0	01	00	Set the data.

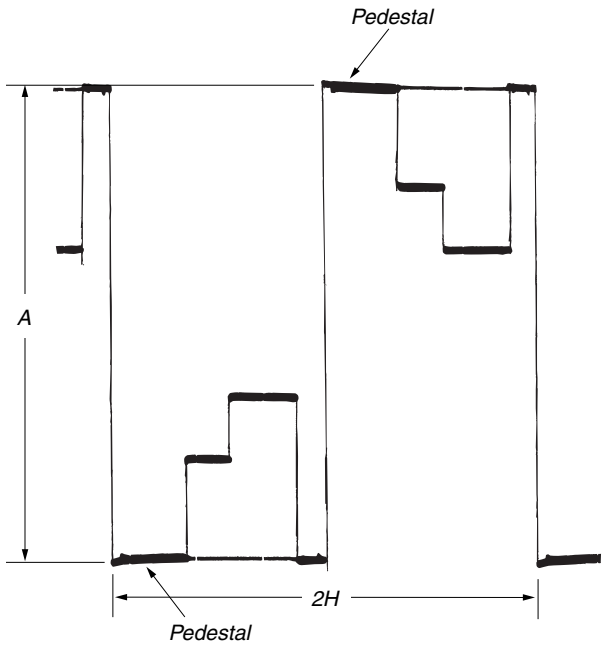


Fig. 6-1-15.

3. Contrast Adjustment (DI-089 board)

Set the level of the VIDEO signal for driving the LCD to the specified value. If deviated, the screen image will be blackish or saturated (whitish).

Note: Do either of the automatic adjustment or the manual adjustment.

3-1. Automatic Adjustment RadarW

Mode	Camera
Subject	Arbitrary
Adjustment Page	C
Adjustment Address	3E

Note: The data of page: 0, address: 10 must be “00”.

Adjusting method:

Order	Page	Address	Data	Procedure
1	0	01	01	Set the data.
2	3	01	51	Set the data, and press PAUSE button.
3	3	02		Check that the data changes from “51” to “00”.
4	3	01	00	Set the data, and press PAUSE button.
5	0	01	00	Set the data.

3-2. Manual Adjustment

Mode	Camera
Subject	Arbitrary
Measurement Point	Pin ⑬ of CN1004 of VC-315 board (EVF VG)
Measuring Instrument	Oscilloscope
Adjustment Page	C
Adjustment Address	3E
Specified Value	A = 2.40 ± 0.05V

Note: The data of page: 0, address: 10 must be “00”.

Adjusting method:

Order	Page	Address	Data	Procedure
1	0	01	01	Set the data.
2	C	3E		Change the data and set the voltage (A) between the 100 IRE and 0 IRE (pedestal) to the specified value. (The data should be “00” to “7F”.)
3	C	3E		Press PAUSE button.
4	0	01	00	Set the data.

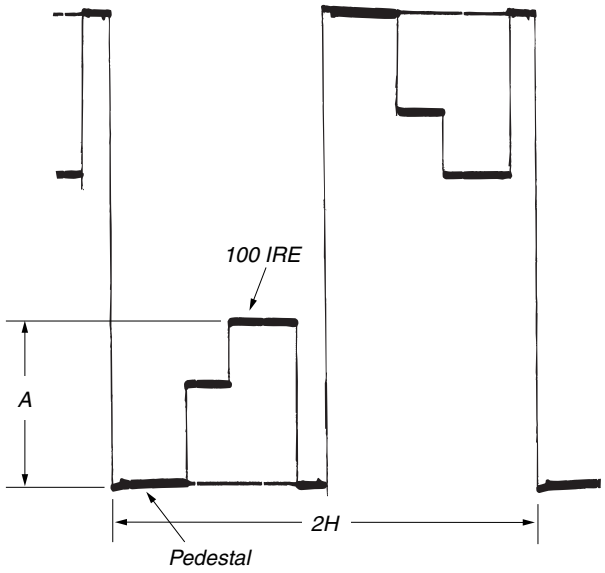


Fig. 6-1-16.

4. White Balance Adjustment (DI-089 board)

Correct the white balance.
If deviated, the reproduction of the EVF screen may degenerate.

Mode	Camera
Subject	Arbitrary
Measurement Point	Check on EVF screen
Measuring Instrument	
Adjustment Page	C
Adjustment Address	3C, 3D
Specified Value	The EVF screen should not be colored.

Note1: Check the white balance only when replacing the following parts. If necessary, adjust them.
1. LCD panel
2. Light induction plate
3. IC3202

Note2: The data of page: 0, address: 10 must be “00”.

Adjusting method:

Order	Page	Address	Data	Procedure
1	0	01	01	Set the data.
2	C	3C	80	Set the data, and press PAUSE button.
3	C	3D	80	Set the data, and press PAUSE button.
4	C	3D		Check that the EVF screen is not colored. If not colored, proceed to step 10.
5	C	3C		Change the data so that the EVF screen is not colored.
6	C	3C		Press PAUSE button.
7	C	3D		Change the data so that the EVF screen is not colored.
8	C	3D		Press PAUSE button.
9	C	3D		If the EVF screen is colored, repeat steps 5 to 9.
10	0	01	00	Set the data.

COVER

1-5. LCD SYSTEM ADJUSTMENT

Note1: The back light (fluorescent tube) is driven by a high voltage AC power supply. Therefore, do not touch the back light holder to avoid electrical shock.
Note2: When replacing the LCD unit, be careful to prevent damages caused by static electricity.
Note3: Before performing the adjustments, check the data of page: 0, address: 10 is "00". If not, set data: 00 to this address.
Note4: NTSC model: DCR-TRV38/TRV39
PAL model: DCR-TRV38E

[Adjusting connector]

Most of the measuring points for adjusting the LCD system are concentrated in CN1004 of the VC-315 board. Connect the measuring instruments via the multi CPC-7 jig (J-6082-382-A). The following table shows the Pin No. and signal name of CN1004.

Pin No.	Signal Name	Pin No.	Signal Name
1	FRRV	9	PANEL VG
2	RF MON	10	GND
3	RF IN/LANC JACK IN	11	EVF VCO
4	SWP	12	GND
5	PANEL COM	13	EVF VG
6	GND	14	EXT DA
7	H START	15	N.C.
8	GND	16	N.C.

Table 6-1-15.

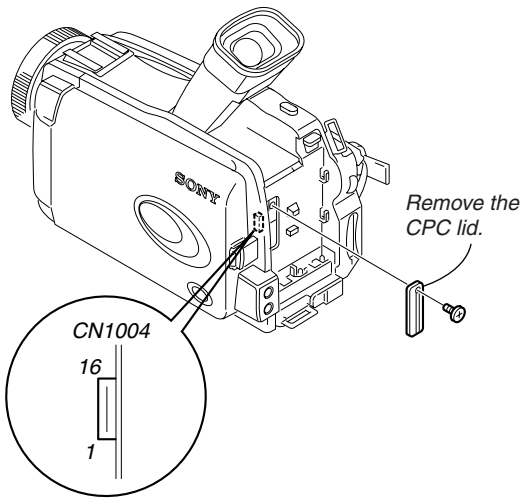


Fig. 6-1-17.

1. VCO Adjustment (PD-190 board)

Set the VCO free-run frequency. If deviated, the LCD screen will be blurred.

Mode	VTR stop
Signal	No signal
Measurement Point	Pin ⑦ of CN1004 of VC-315 board (H START)
Measuring Instrument	Frequency counter
Adjustment Page	C
Adjustment Address	47, 48
Specified Value	f = 15734 ± 30Hz (NTSC) f = 15625 ± 30Hz (PAL)

Note: The data of page: 0, address: 10 must be "00".

Adjusting method:

Order	Page	Address	Data	Procedure
1	0	01	01	Set the data.
2	C	47		Change the data and set the VCO frequency (f) to the specified value.
3	C	47		Press PAUSE button.
4	C	47		Read the data, and this data is named D_{47}.
5	C	48	D_{47}	Set the data, and press PAUSE button.
6	0	01	00	Set the data.

2. RGB AMP Adjustment (PD-190 board)

Set the D range of the RGB decoder used to drive the LCD to the specified value. If deviated, the LCD screen will become blackish or saturated (whitish).

Mode	VTR stop
Signal	No signal
Measurement Point	Pin ⑨ of CN1004 of VC-315 board (PANEL VG)
Measuring Instrument	Oscilloscope
Adjustment Page	C
Adjustment Address	4A
Specified Value	A = 3.70 ± 0.05V (NTSC) A = 3.45 ± 0.05V (PAL)

Note: The data of page: 0, address: 10 must be “00”.

Adjusting method:

Order	Page	Address	Data	Procedure
1	0	01	01	Set the data.
2	C	4A		Change the data and set the voltage (A) between the reversed waveform pedestal and non-reversed waveform pedestal to the specified value.
3	C	4A		Press PAUSE button.
4	0	01	00	Set the data.
5				Perform “Contrast Adjustment”, “COM AMP Adjustment” and “V COM Adjustment”.

3. Contrast Adjustment (PD-190 board)

Set the level of the VIDEO signal for driving the LCD to the specified value. If deviated, the screen image will be blackish or saturated (whitish).

Mode	VTR stop
Signal	No signal
Measurement Point	Pin ⑨ of CN1004 of VC-315 board (PANEL VG)
Measuring Instrument	Oscilloscope
Adjustment Page	C
Adjustment Address	4F
Specified Value	A = 3.30 ± 0.05V (NTSC) A = 3.25 ± 0.05V (PAL)

Note: The data of page: 0, address: 10 must be “00”.

Adjusting method:

Order	Page	Address	Data	Procedure
1	0	01	01	Set the data.
2	C	4F		Change the data and set the voltage (A) between the 100 IRE and 0 IRE (pedestal) to the specified value. (The data should be “00” to “7F”.)
3	C	4F		Press PAUSE button.
4	0	01	00	Set the data.
5				Perform “COM AMP Adjustment” and “V COM Adjustment”.

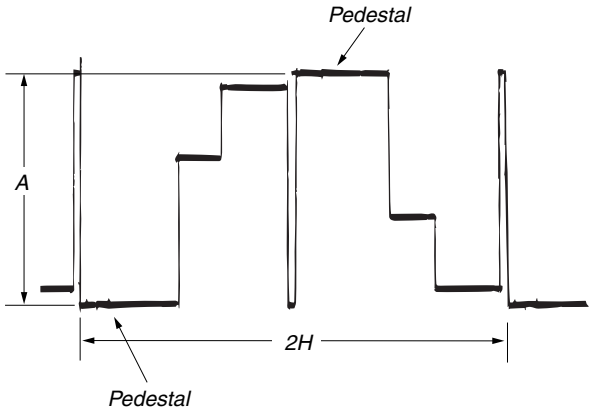


Fig. 6-1-18.

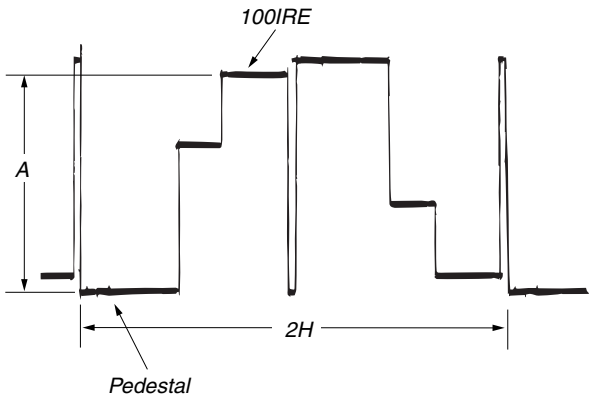


Fig. 6-1-19.

4. COM AMP Adjustment (PD-190 board)

Set the common electrode drive signal level of LCD to the specified value.

Mode	VTR stop
Signal	No signal
Measurement Point	Pin ⑤ of CN1004 of VC-315 board (PANEL COM)
Measuring Instrument	Oscilloscope
Adjustment Page	C
Adjustment Address	4C
Specified Value	A = 6.00 ± 0.05V

Note: The data of page: 0, address: 10 must be "00".

Adjusting method:

Order	Page	Address	Data	Procedure
1	0	01	01	Set the data.
2	C	4C		Change the data and set the PANEL COM signal level (A) to the specified value.
3	C	4C		Press PAUSE button.
4	0	01	00	Set the data.
5				Perform "V COM Adjustment".

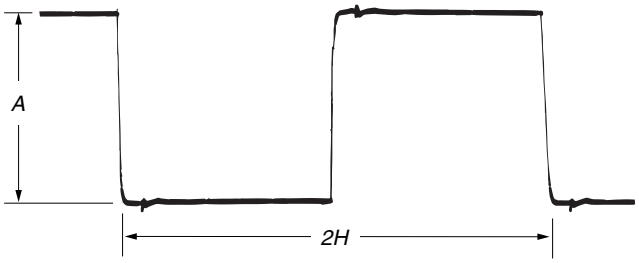


Fig. 6-1-20.

5. V COM Adjustment (PD-190 board)

Set the DC bias of the common electrode drive signal of LCD to the specified value.

If deviated, the LCD display will move, producing flicker and conspicuous vertical lines.

Mode	VTR stop
Signal	No signal
Measurement Point	Check on LCD display
Measuring Instrument	
Adjustment Page	C
Adjustment Address	49
Specified Value	The brightness difference between the section A and section B is minimum.

Note1: This adjustment should be carried out upon completion of the following adjustments.
RGB AMP Adjustment
Contrast Adjustment
COM AMP Adjustment

Note2: The data of page: 0, address: 10 must be "00".

Adjusting method:

Order	Page	Address	Data	Procedure
1	0	01	01	Set the data.
2	C	49		Change the data so that the brightness of the section A and that of the section B is equal.
3	C	49		Subtract 8 from the data.
4	C	49		Press PAUSE button.
5	0	01	00	Set the data.

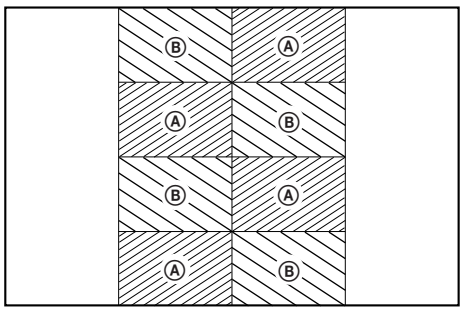


Fig. 6-1-21.

6. White Balance Adjustment (PD-190 board)

Correct the white balance.
If deviated, the reproduction of the LCD screen may degenerate.

Mode	VTR stop
Signal	No signal
Measurement Point	Check on LCD screen
Measuring Instrument	
Adjustment Page	C
Adjustment Address	4D, 4E
Specified Value	The LCD screen should not be colored.

Note1: Check the white balance only when replacing the following parts. If necessary, adjust them.
1. LCD panel
2. Light induction plate
3. IC5501

Note2: The data of page: 0, address: 10 must be “00”.

Adjusting method:

Order	Page	Address	Data	Procedure
1	0	01	01	Set the data.
2	C	4D	7F	Set the data, and press PAUSE button.
3	C	4E	87	Set the data, and press PAUSE button.
4	C	4E		Check that the LCD screen is not colored. If not colored, proceed to step 10.
5	C	4D		Change the data so that the LCD screen is not colored.
6	C	4D		Press PAUSE button.
7	C	4E		Change the data so that the LCD screen is not colored.
8	C	4E		Press PAUSE button.
9	C	4E		If the LCD screen is colored, repeat steps 5 to 9.
10	0	01	00	Set the data.

COVER

6-2. MECHANISM SECTION ADJUSTMENT

On the mechanism section adjustment

For detail of mechanism section adjustments, checks, and replacement of mechanism parts, refer to the separate volume "DV MECHANICAL ADJUSTMENT MANUAL Ⅶ Z Mechanism".

Note: Before performing the adjustments, check the data of page: 0, address: 10 is "00". If not, set data: 00 to this address.

2-1. HOW TO ENTER RECORD MODE WITHOUT CASSETTE

1) Connect the adjustment remote commander to the LANC jack.
2) Turn the HOLD switch of the adjustment remote commander to the ON position.
3) Close the cassette compartment without the cassette.
4) Select page: 3, address: 01, and set data: 0C, and press the PAUSE button of the adjustment remote commander. (The mechanism enters the record mode automatically.)
   Note: The function buttons becomes inoperable.
5) To quit the record mode, select page: 3, address: 01, set data: 00, and press the PAUSE button of the adjustment remote commander. (Whenever you want to quit the record mode, be sure to quit following this procedure.)

2-2. HOW TO ENTER PLAYBACK MODE WITHOUT CASSETTE

1) Connect the adjustment remote commander to the LANC jack.
2) Turn the HOLD switch of the adjustment remote commander to the ON position.
3) Close the cassette compartment without the cassette.
4) Select page: 3, address: 01, and set data: 0B, and press the PAUSE button of the adjustment remote commander. (The mechanism enters the playback mode automatically.)
   Note: The function buttons becomes inoperable.
5) To quit the playback mode, select page: 3, address: 01, set data: 00, and press the PAUSE button of the adjustment remote commander. (Whenever you want to quit the playback mode, be sure to quit following this procedure.)

2-3. TAPE PATH ADJUSTMENT

1. Preparation for Adjustment

1) Clean the tape running side (tape guide, drum, capstan shaft, pinch roller, etc.).
2) Connect the adjustment remote commander to the LANC jack.
3) Turn the HOLD switch of the adjustment remote commander to the ON position.
4) Connect an oscilloscope to VC-315 board CN1004 via the CPC-7 jig (J-6082-382-A).
   Channel 1: VC-315 board, CN1004 Pin ② (Note)
   External trigger: VC-315 board, CN1004 Pin ④
   Note: Connect a 75Ω resistor between Pins ② of CN1004 and ⑥ (GND).
5) Playback the alignment tape for tracking. (XH2-1)
6) Select page: 3, address: 33, and set data: 08.
7) Select page: 3, address: 26, set data: 31, and press PAUSE button.
8) Check that the oscilloscope RF waveform is normal at the entrance and exit.If not normal, adjust according to the separate volume "DV MECHANICAL ADJUSTMENT MANUAL Ⅶ Z Mechanism".

CN1004 of VC-315 board

Pin No.	Signal Name	Pin No.	Signal Name
1	FRRV	9	PANEL VG
2	RF MON	10	GND
3	RF IN/LANC JACK IN	11	EVF VCO
4	SWP	12	GND
5	PANEL COM	13	EVF VG
6	GND	14	EXT DA
7	H START	15	N.C.
8	GND	16	N.C.

Table 6-2-1.

2. Processing after Completing Operations:

1) Connect the adjustment remote commander to the LANC jack and set the HOLD switch to the ON position.
2) Select page: 3, address: 26, and set data: 00, and press PAUSE button.
3) Select page: 3, address: 33, and set data: 00.

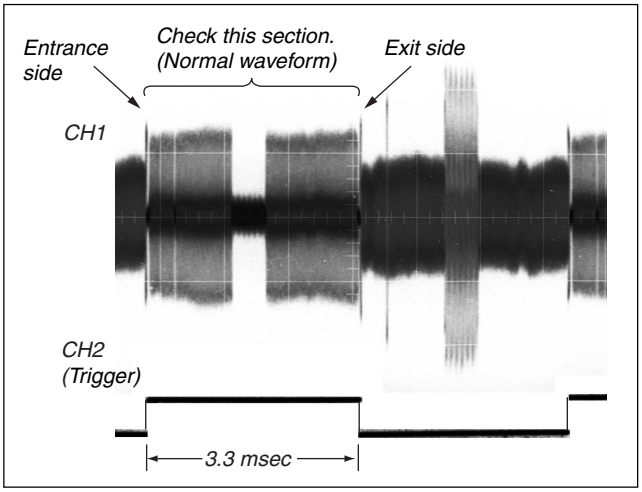


Fig. 6-2-1.

COVER

6-3. VIDEO SECTION ADJUSTMENT

3-1. PREPARATIONS BEFORE ADJUSTMENTS

Use the following measuring instruments for video section adjustments.

3-1-1. Equipment to Required

1) TV monitor
2) Oscilloscope (dual-phenomenon, band width above 30 MHz with delay mode) (Unless specified otherwise, use a 10 : 1 probe.)
3) Frequency counter
4) Pattern generator with video output terminal
5) Digital voltmeter
6) Audio generator
7) Audio level meter
8) Audio distortion meter
9) Audio attenuator
10) Regulated power supply
11) Alignment tapes
    - Tracking standard (XH2-1)
      Parts code: 8-967-997-01
    - SW/OL standard (XH2-3)
      Parts code: 8-967-997-11
    - Audio operation check for NTSC (XH5-3)
      Parts code: 8-967-997-51
    - System operation check for NTSC (XH5-5)
      Parts code: 8-967-997-61
    - Audio operation check for PAL (XH5-3P)
      Parts code: 8-967-997-55
    - System operation check for PAL (XH5-5P)
      Parts code: 8-967-997-66
12) Adjustment remote commander (J-6082-053-B)
13) CPC-7 jig (J-6082-382-A)
14) Extension cable (100P 0.5mm) (J-6082-352-A)
    For extension between the DI-089 board (CN4004) and the VC-315 board (CN1003)

3-1-2. Precautions on Adjusting

Note1: Before performing the adjustments, check the data of page: 0, address: 10 is "00". If not, set data: 00 to this address.

1) The adjustments of this unit are performed in the VTR mode or camera mode.
   To set to the VTR mode, set the power switch to "VCR" (or "PLAYER") or set the "Forced VTR Power ON mode" using the adjustment remote commander (Note2).
   To set to the Camera mode, set the power switch to "CAMERA" or set the "Forced Camera Power ON mode" using the adjustment remote commander (Note3).
   After completing adjustments, be sure to exit the "Forced VTR Power ON Mode" or "Forced Camera Power ON Mode". (Note5)
2) The front panel block (Microphone unit, MA-423 board, SE-136 board (MF sensor) must be assembled for connecting the adjustment remote commander. To remove it, disconnect the following connector.
   MA-423 board CN5903 (14P, 0.5mm)
3) Cabinet (R) (CK-131board, LCD block) need not be connected. But removing the cabinet (R) (removing the VC-315 board CN1007) means removing the lithium 3V power supply (CK-131 board, BT5201) , data such as date, time, user-set menus will be lost. After completing adjustments, reset these data.
   But, the self-diagnosis data and the data on history of use (total drum rotation time etc.) will be kept even if the cabinet (R) has been removed. (Refer to "6-4.Service Mode" for the data on the history use and the self-diagnosis data.)
   To remove the cabinet (R), disconnect the following connector.
   VC-315 board CN1007 (51P, 0.3mm)
4) The EVF block (LB-087 board) is need not be connected. To remove it, disconnect the following connector.
   DI-089 board CN3201 (20P, 0.5mm)
5) The intelligent accessory shoe is need not be connected. To remove it, disconnect the following connector.
   DI-089 board CN4001 (10P, 0.5mm)
6) To open the DI-089 board, use the following extension cable between the DI-089 board CN4004 and VC-315 board CN1003.
   J-6082-352-A (100P, 0.5mm)
7) The lens block (CD-436 board) is need not be connected. To remove it, disconnect the following connectors.
   VC-315 board CN1501 (24P, 0.5mm)
   VC-315 board CN1301 (27P, 0.3mm)
8) By setting the "Forced VTR Power ON mode", the video section can be operate even if the control switch block (PS-2890) has been removed. When removing the control switch blocks (PS-2890 and FK4300) and the memory stick connector, disconnect the following connector.
   VC-315 board CN1006 (27P, 0.3mm)

Note2: Setting the "Forced VTR Power ON" mode (VTR mode)
1) Select page: 0, address: 01, and set data: 01.
2) Select page: D, address: 10, set data: 02, and press the PAUSE button of the adjustment remote commander.
   The above procedure will enable the VTR power to be turned on with the control switch block (PS-2890 block) removed.
   After completing adjustments, be sure to exit the "Forced Power ON mode".

Note3: Setting the "Forced Camera Power ON" mode (Camera mode)
1) Select page: 0, address: 01, and set data: 01.
2) Select page: D, address: 10, set data: 01, and press the PAUSE button of the adjustment remote commander.
   The above procedure will enable the camera power to be turned on with the control switch block (PS-2890 block) removed.
   After completing adjustments, be sure to exit the "Forced Power ON mode".

Note4: Setting the "Forced Memory Power ON" mode (Memory mode)
1) Select page: 0, address: 01, and set data: 01.
2) Select page: D, address: 10, set data: 05, and press the PAUSE button of the adjustment remote commander.
   The above procedure will enable the memory power to be turned on with the control switch block (PS-2890 block) removed.
   After completing adjustments, be sure to exit the "Forced Power ON mode".

Note5: Exiting the "Forced Power ON" mode
1) Select page: 0, address: 01, and set data: 01.
2) Select page: D, address: 10, set data: 00, and press the PAUSE button of the adjustment remote commander.
3) Select page: 0, address: 01, and set data: 00.

3-1-3. Adjusting Connectors

The measuring point of the playback RF signal is CN1004 of VC-315 board. Connect the measuring instruments via the CPC-7 jig (J-6082-382-A). Refer to "MECHANISM SECTION ADJUSTMENT" for the measuring method. The following table lists the pin numbers and signal names of CN1004.

Pin No.	Signal Name	Pin No.	Signal Name
1	FRRV	9	PANEL VG
2	RF MON	10	GND
3	RF IN/LANC JACK IN	11	EVF VCO
4	SWP	12	GND
5	PANEL COM	13	EVF VG
6	GND	14	EXT DA
7	H START	15	N.C.
8	GND	16	N.C.

Table 6-3-1.

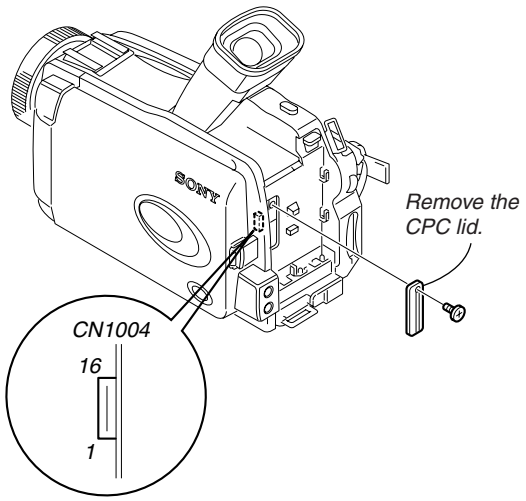


Fig. 6-3-1.

3-1-4. Connecting the Equipment

Connect the measuring instruments as shown in Fig. 6-3-2, and perform the adjustments.

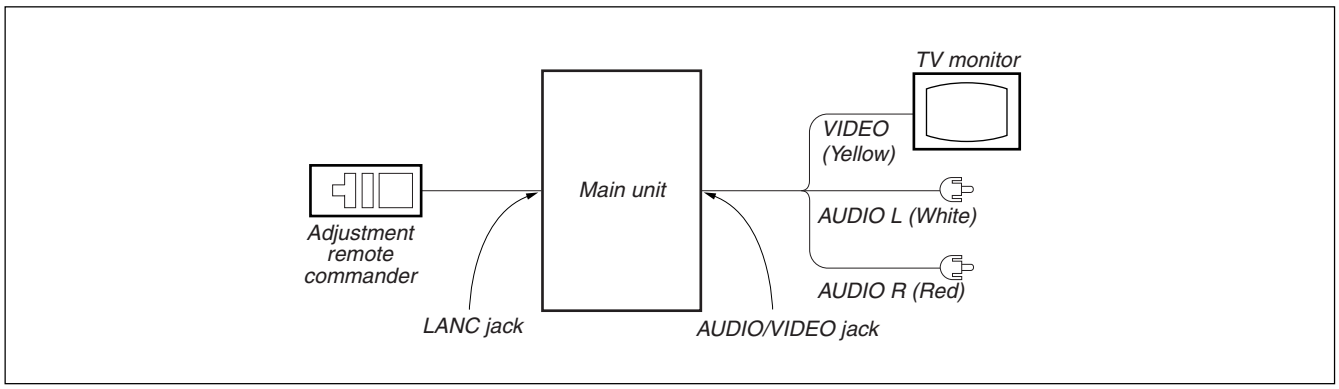


Fig. 6-3-2.

3-1-5. Alignment Tapes

Use the alignment tapes shown in the following table.
Use tapes specified in the signal column of each adjustment.

Name	Use
Tracking standard (XH2-1)	Tape path adjustment
SW/OL standard (XH2-3)	Switching position adjustment
Audio operation check (XH5-3 (NTSC), XH5-3P (PAL))	Audio system adjustment
System operation check (XH5-5 (NTSC), XH5-5P (PAL))	Operation check

Fig. 6-3-3 shows the 75% color bar signals recorded on the alignment tape for Audio Operation Check.

Note: Measure with video terminal (Terminated at 75 Ω)

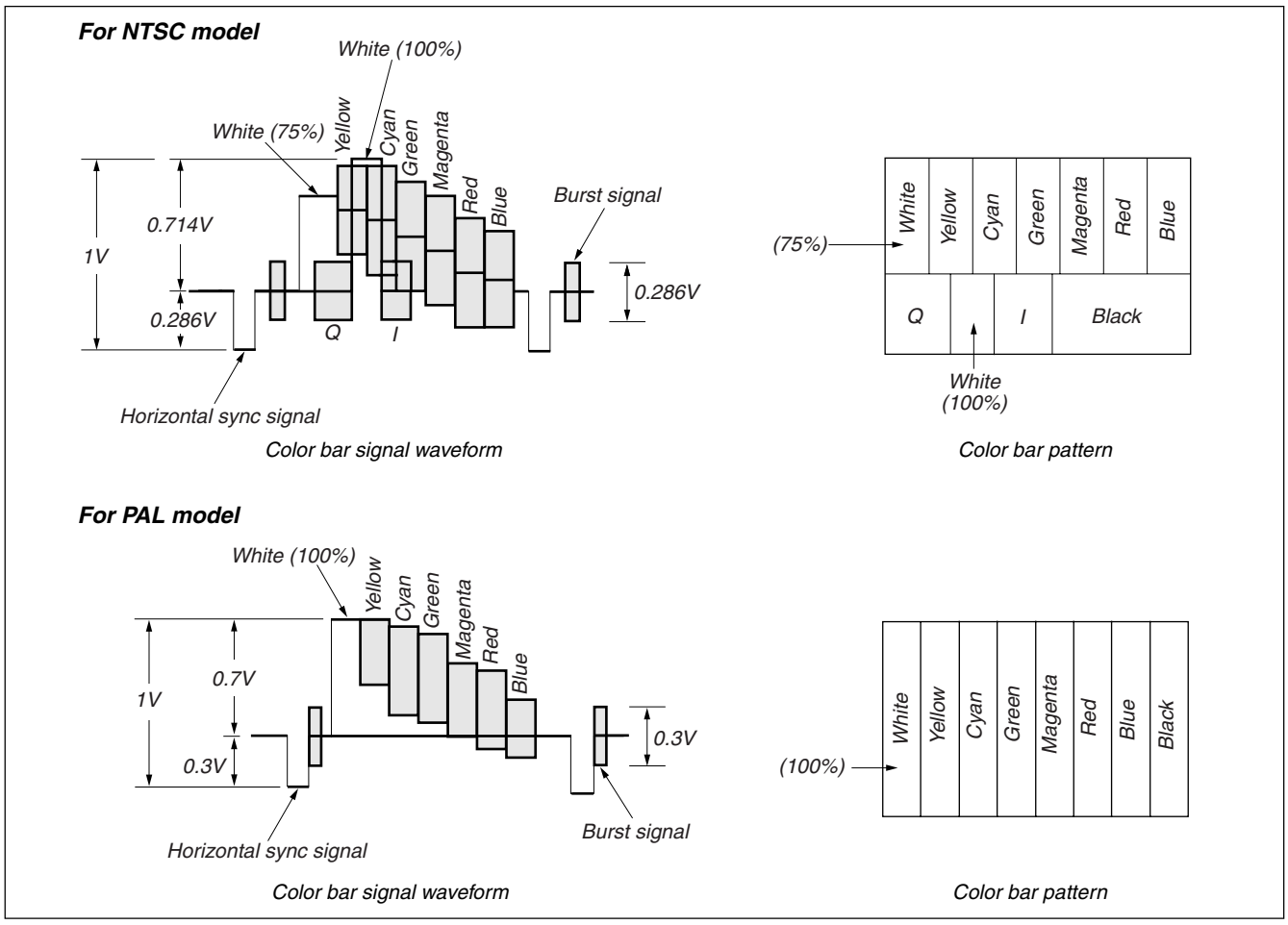


Fig. 6-3-3. Color bar signal of alignment tapes

3-1-6. Input/Output Level and Impedance

Video input/output
- Special stereo mini jack
- Video signal: 1 Vp-p, 75 Ω unbalanced, sync negative

S video input/output
- 4-pin mini DIN
- Luminance signal: 1 Vp-p, 75 Ω unbalanced, sync negative
- Chrominance signal: 0.286 Vp-p, 75 Ω unbalanced (NTSC)
  : 0.300 Vp-p, 75 Ω unbalanced (PAL)

Audio input/output
- Special stereo mini jack
- Input level: 327mV
- Input impedance: More than 47kΩ
- Output level: 327 mV (at load impedance 47 kΩ)
- Output impedance: Below 2.2 kΩ

COVER

3-2. SYSTEM CONTROL SYSTEM ADJUSTMENT

1. Initialization of 8, A, B, C, D, E, F, 18, 1B, 1C, 1E, 1F Page Data

If the 8, A, B, C, D, E, F, 18, 1B, 1C, 1E, 1F page data is erased due to some reason, perform "1-2. INITIALIZATION OF 8, A, B, C, D, E, F, 18, 1B, 1C, 1E, 1F PAGE DATA" of "6-1. CAMERA SECTION ADJUSTMENT"

Note: When reading or writing the 18, 1B, 1C, 1E, 1F page data, select page: 0, address: 10, and set data: 01, then select 8, B, C, E or F page. The 18, 1B, 1C, 1E or 1F page can be chosen by this data setting.
After reading or writing, reset the data of page: 0, address: 10 to "00".

2. Touch Panel Adjustment

Adjust the calibration of the touch panel.

Mode	VTR stop
Signal	Arbitrary
Adjustment Page	A
Adjustment Address	90 to 93

Note1: Perform this adjustment with observing the screen from the front.
Note2: The data of page: 0, address: 10 must be "00".

Adjusting method:

1) Select page: 7, address: 05, and set data: 01.
2) Using a stylus, push the center of "X" indicated in the part A.
3) Using a stylus, push the center of "X" indicated in the part B.
4) Using a stylus, push the center of "X" indicated in the part C.
5) Select page: 7, address: 05, and check that the data is "00".

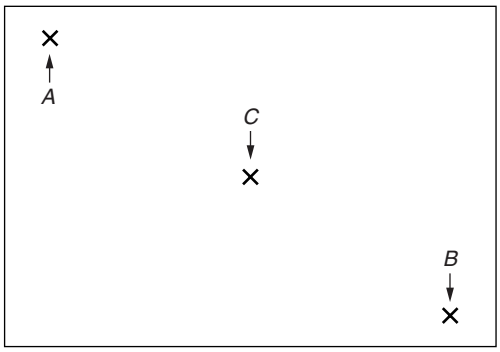


Fig. 6-3-4.

3. Serial No. Input

3-1. Company ID Input

Write the company ID in the EEPROM (nonvolatile memory).

Page	C
Address	E0, E1, E2, E3, E4

Note: The data of page: 0, address: 10 must be "00".

Input method:

1) Select page: 0, address: 01, and set data: 01.
2) Input the following data to page: C, addresses: E0 to E4.
   Note: Press the PAUSE button of the adjustment remote commander each time to set the data.

Address	Data
E0	08
E1	00
E2	46
E3	01
E4	02

3) Select page: 0, address: 01, and set data: 00.

3-2. Serial No. Input

Write the serial No. and model code in the EEPROM (nonvolatile memory). Convert the serial No. on the name plate from decimal to hexadecimal, and write in the EEPROM.

Page	C
Address	E5, E6, E7

Note: The data of page: 0, address: 10 must be "00".

Input method:

1) Select page: 0, address: 01, and set data: 01.
2) Read the serial No. on the name plate, and take it as D_1.
   Example: If the serial No. is 77881.
   $D_1 = 77881$
   Note: Use six digits of the low rank when a serial No. is more than seven digits.
3) Obtain D_2 and H_1 corresponding to D_1 from Table 6-3-2.
   Example: If D_1 is "77881".
   $D_2 = D_1 - 65536 = 12345$
   $H_1 = FE$

D_1 (Decimal)	D_2 (Decimal)	H_1 (Hexadecimal) (Service model code)
000001 to 065535	D_1	FE
065536 to 131071	$D_1 - 65536$	FE
131072 to 196607	$D_1 - 131072$	FE

Table 6-3-2.

4) Input H1 to page: C, address: E5. (Model code input)
   Example: If H_1 is "FE".
   Select page: C, address: E5, set data: FE, and press the PAUSE button.
5) Obtain the maximum decimal not exceeding D_2 from Table 6-3-3, and take this as D_3.
   Example: If D_2 is "12345".
   $D_3 = 12288$
6) Obtain the hexadecimal corresponding to D_3 from Table 6-3-3, and take this as H_3.
   Example: If D_3 is "12288".
   $H_3 = 3000$
7) Obtain the difference D_4 between D_2 and D_3. (Decimal calculation, $0 \leqq D_4 \leqq 255$)
   $D_4 = D_2 - D_3$
   Example: If D_2 is "12345" and D_3 is "12288".
   $D_4 = 12345 - 12288 = 57$
8) Convert D_4 to hexadecimal, and take this as H_4.
   (Refer to "Hexadecimal-decimal conversion table" in "6-4. Service Mode".)
   Example: If D_4 is "57".
   $H_4 = 39$
9) Input the upper 2 digits of H_3 to page: C, address: E6.
   Example: If H_3 is "3000".
   Select page: C, address: E6, set data: 30, and press the PAUSE button.
10) Input H_4 to page: C, address: E7.
    Example: If H_4 is "39".
    Select page: C, address: E7, set data: 39, and press the PAUSE button.
11) Select page: 0, address: 01, and set data: 00.

Decimal (D_3)	Hexa-decimal (H_3)	Decimal (D_3)	Hexa-decimal (H_3)	Decimal (D_3)	Hexa-decimal (H_3)	Decimal (D_3)	Hexa-decimal (H_3)	Decimal (D_3)	Hexa-decimal (H_3)	Decimal (D_3)	Hexa-decimal (H_3)	Decimal (D_3)	Hexa-decimal (H_3)	Decimal (D_3)	Hexa-decimal (H_3)
0	0000	8192	2000	16384	4000	24576	6000	32768	8000	40960	A000	49152	C000	57344	E000
256	0100	8448	2100	16640	4100	24832	6100	33024	8100	41216	A100	49408	C100	57600	E100
512	0200	8704	2200	16896	4200	25088	6200	33280	8200	41472	A200	49664	C200	57856	E200
768	0300	8960	2300	17152	4300	25344	6300	33536	8300	41728	A300	49920	C300	58112	E300
1024	0400	9216	2400	17408	4400	25600	6400	33792	8400	41984	A400	50176	C400	58368	E400
1280	0500	9472	2500	17664	4500	25856	6500	34048	8500	42240	A500	50432	C500	58624	E500
1536	0600	9728	2600	17920	4600	26112	6600	34304	8600	42496	A600	50688	C600	58880	E600
1792	0700	9984	2700	18176	4700	26368	6700	34560	8700	42752	A700	50944	C700	59136	E700
2048	0800	10240	2800	18432	4800	26624	6800	34816	8800	43008	A800	51200	C800	59392	E800
2304	0900	10496	2900	18688	4900	26880	6900	35072	8900	43264	A900	51456	C900	59648	E900
2560	0A00	10752	2A00	18944	4A00	27136	6A00	35328	8A00	43520	AA00	51712	CA00	59904	EA00
2816	0B00	11008	2B00	19200	4B00	27392	6B00	35584	8B00	43776	AB00	51968	CB00	60160	EB00
3072	0C00	11264	2C00	19456	4C00	27648	6C00	35840	8C00	44032	AC00	52224	CC00	60416	EC00
3328	0D00	11520	2D00	19712	4D00	27904	6D00	36096	8D00	44288	AD00	52480	CD00	60672	ED00
3584	0E00	11776	2E00	19968	4E00	28160	6E00	36352	8E00	44544	AE00	52736	CE00	60928	EE00
3840	0F00	12032	2F00	20224	4F00	28416	6F00	36608	8F00	44800	AF00	52992	CF00	61184	EF00
4096	1000	12288	3000	20480	5000	28672	7000	36864	9000	45056	B000	53248	D000	61440	F000
4352	1100	12544	3100	20736	5100	28928	7100	37120	9100	45312	B100	53504	D100	61696	F100
4608	1200	12800	3200	20992	5200	29184	7200	37376	9200	45568	B200	53760	D200	61952	F200
4864	1300	13056	3300	21248	5300	29440	7300	37632	9300	45824	B300	54016	D300	62208	F300
5120	1400	13312	3400	21504	5400	29696	7400	37888	9400	46080	B400	54272	D400	62464	F400
5376	1500	13568	3500	21760	5500	29952	7500	38144	9500	46336	B500	54528	D500	62720	F500
5632	1600	13824	3600	22016	5600	30208	7600	38400	9600	46592	B600	54784	D600	62976	F600
5888	1700	14080	3700	22272	5700	30464	7700	38656	9700	46848	B700	55040	D700	63232	F700
6144	1800	14336	3800	22528	5800	30720	7800	38912	9800	47104	B800	55296	D800	63488	F800
6400	1900	14592	3900	22784	5900	30976	7900	39168	9900	47360	B900	55552	D900	63744	F900
6656	1A00	14848	3A00	23040	5A00	31232	7A00	39424	9A00	47616	BA00	55808	DA00	64000	FA00
6912	1B00	15104	3B00	23296	5B00	31488	7B00	39680	9B00	47872	BB00	56064	DB00	64256	FB00
7168	1C00	15360	3C00	23552	5C00	31744	7C00	39936	9C00	48128	BC00	56320	DC00	64512	FC00
7424	1D00	15616	3D00	23808	5D00	32000	7D00	40192	9D00	48384	BD00	56576	DD00	64768	FD00
7680	1E00	15872	3E00	24064	5E00	32256	7E00	40448	9E00	48640	BE00	56832	DE00	65024	FE00
7936	1F00	16128	3F00	24320	5F00	32512	7F00	40704	9F00	48896	BF00	57088	DF00	65280	FF00

Table 6-3-3.

COVER

3-3. SERVO AND RF SYSTEM ADJUSTMENT

Before perform the servo and RF system adjustments, check that the specified value of "54 MHz/66 MHz Origin Oscillation Adjustment" of "CAMERA SYSTEM ADJUSTMENT" is satisfied. And check that the data of page: 0, address: 10 is "00". If not, set data: 00 to this address.

Adjusting Procedure:

1. CAP FG duty adjustment
2. Switching position adjustment
3. Error rate check

1. Cap FG Duty Adjustment (VC-315 Board) RadarW

Set the Cap FG signal duty cycle to 50% to establish an appropriate capstan servo. If deviated, the uneven rotation of capstan and noise can occur.

Measurement Point	Display data of page: 3, address: 02, 03
Measuring Instrument	Adjustment remote commander
Adjustment Page	C
Adjustment Address	16
Specified Value	Data of page: 3, address: 02 is "00". Data of page: 3, address: 03 is "00".

Note1: The data of page: 0, address: 10 must be "00".

Adjusting method:

Order	Page	Address	Data	Procedure
1				Close the cassette compartment without inserting a cassette.
2	0	01	01	Set the data.
3	3	01	1B	Set the data, and press PAUSE button.
4	3	02		Check that the data changes in the following order. "1B" → "2B" → "00"
5	3	03		Check that the data is "00". (Note2)
6	0	01	00	Set the data.

Note2: If the data is "01", adjustment has errors or the mechanism deck is defective.

2. Switching Position Adjustment (VC-315 Board) RadarW

To obtain normal playback waveform output during the playback mode, adjust the switching position.

Mode	VTR playback
Signal	SW/OL reference tape (XH2-3)
Measurement Point	Display data of page: 3, address: 02, 03
Measuring Instrument	Adjustment remote commander
Adjustment Page	C
Adjustment Address	10, 11, 12, 13
Specified Value	Data of page: 3, address: 02 is "00". Data of page: 3, address: 03 is "00".

Note1: The data of page: 0, address: 10 must be "00".

Adjusting method:

Order	Page	Address	Data	Procedure
1				Insert the SW/OL reference tape and enter the VTR STOP mode.
2	0	01	01	Set the data.
3	C	10	EE	Set the data, and press PAUSE button.
4	3	21		Check that the data is "02". (Note2)
5	3	01	0D	Set the data, and press PAUSE button.
6	3	02		Check that the data changes to "00".
7	3	03		Check that the data is "00". (Note3)
8	0	01	00	Set the data.

Note2: If the data of page: 3, address: 21 is "72", the tape top being played. After playing the tape for 1 to 2 seconds, stop it, perform step 5 and higher.
If the data of page: 3, address: 21 is "62", the tape end being played. After rewinding the tape, perform step 5 and higher.

Note3: If bit 0 of the data is "1", the EVEN channel is defective. If bit 1 is "1", the ODD channel is defective. Contents of the defect is written into page: C, addresses: 10 and 12. See the following table. (For the bit values, refer to "6-4. SERVICE MODE", "4-3. 3. Bit value discrimination".) If bit 3 of the data is "1", the tape end being played, so rewind the tape and perform the adjustment again.

When the EVEN channel is defective

Data of page: C, address: 10	Contents of defect
EE	Writing into EEPROM (IC2602) is defective
E8	Adjustment data is out of range
E7	No data is returned from IC2301

When the ODD channel is defective

Data of page: C, address: 12	Contents of defect
EE	Writing into EEPROM (IC2602) is defective
E8	Adjustment data is out of range
E7	No data is returned from IC2301

3. Error Rate Check

3-1. Preparations before adjustments RadarW

Mode	Camera recording
Subject	Arbitrary

Adjusting method:

Order	Page	Address	Data	Procedure
1	0	01	01	Set the data.
2	0	10	01	Set the data.
3	C	0D	C8	Set the data, and press PAUSE button.
4	0	10	00	Set the data.
5				Record the camera signal for two minutes.

3-2. Error Rate Check

Mode	Playback
Signal	Recorded signal at “Preparations before adjustments”
Measurement Point	Display data of page: 3, address: 02, 03
Measuring Instrument	Adjustment remote commander
Adjustment Page	1C (Note1)
Adjustment Address	B3 to C8
Specified Value	Data of page: 3, address: 02 is “00”. Data of page: 3, address: 03 is “00”.

Note1: When reading or writing the 1C page data, select page: 0, address: 10, and set data: 01, then select C page. The 1C page can be chosen by this data setting.
After reading or writing, reset the data of page: 0, address: 10 to “00”.

Adjusting method:

Order	Page	Address	Data	Procedure
1				Playback the recorded signal at “Preparations before adjustments”
2	0	01	01	Set the data.
3	0	10	00	Set the data.
4	3	1D		Check that the data is “20”.
5	3	01	40	Set the data, and press PAUSE button.
6	3	02		Check that the data changes from “40” to “00”.
7	3	03		Check that the data is “00”. (Note2)
8				Perform “Processing after Completing Adjustments”

Note2: If the data is other than “00”, Error rate is abnormal.
For the contents of the abnormality, see the following table.

Data of page: 3, address: 03	Contents of the abnormality
01	EVEN ch is abnormal.
02	ODD ch is abnormal.
03	EVEN ch and ODD ch are abnormal.

Note3: If Error rate is abnormal, Check the use tape, clean the tape running surface. And after inputting initial values to page 1C: address: B3 to C8, perform re-adjustment. (See Table 6-3-4.)

Initial Value of Page 1C: Address: B3 to C8

Address	Initial value	Address	Initial value	Address	Initial value
B3	00	BB	00	C3	80
B4	00	BC	00	C4	00
B5	00	BD	00	C5	00
B6	00	BE	00	C6	00
B7	00	BF	00	C7	00
B8	80	C0	00	C8	00
B9	00	C1	00		
BA	00	C2	00		

Table 6-3-4.

Note4: When writing the 1C page data, select page: 0, address: 10, and set data: 01, then select C page.
After writing the initial values, reset the data of page: 0, address: 10 to “00”.

3-3. Processing after Completing Adjustments

Order	Page	Address	Data	Procedure
1	0	01	01	Set the data.
2	0	10	01	Set the data.
3	C	0D	00	Set the data, and press PAUSE button.
4	0	01	00	Set the data.
5	0	10	00	Set the data.

COVER

3-4. VIDEO SYSTEM ADJUSTMENTS

Note1: Before perform the servo and RF system adjustments, check that the specified value of "54 MHz/66 MHz Origin Oscillation Adjustment" of "CAMERA SYSTEM ADJUSTMENT" is satisfied. And check that the data of page: 0, address: 10 is "00". If not, set data: 00 to this address.

Note2: NTSC model: DCR-TRV38/TRV39
PAL model: DCR-TRV38E

1. S VIDEO OUT Y Level Adjustment (VC-315 Board)

Mode	Camera
Subject	Arbitrary
Measurement Point	Y signal terminal of S VIDEO jack (75Ω terminated)
Measuring Instrument	Oscilloscope
Adjustment Page	C
Adjustment Address	25
Specified Value	A = 1000 ± 14mV

Note: The data of page: 0, address: 10 must be "00".

Switch setting:

DEMO MODE (Menu setting) ..... OFF

Adjusting method:

Order	Page	Address	Data	Procedure
1	0	01	01	Set the data.
2	3	0C	02	Set the data, and press PAUSE button.
3	C	25		Change the data and set the Y signal level (A) to the specified value.
4	C	25		Press PAUSE button.
5	3	0C	00	Set the data, and press PAUSE button.
6	0	01	00	Set the data.

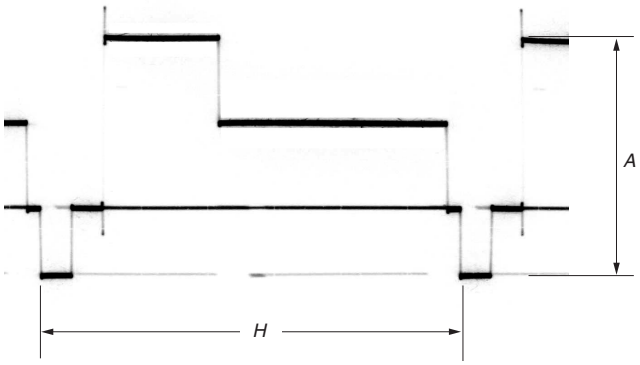


Fig. 6-3-5.

2. S VIDEO OUT Chroma Level Adjustment (VC-315 Board)

Mode	Camera
Subject	Arbitrary
Measurement Point	Chroma signal terminal of S VIDEO jack (75Ω terminated) External trigger: Y signal terminal of S VIDEO jack
Measuring Instrument	Oscilloscope
Adjustment Page	C
Adjustment Address	26, 27
Specified Value	Cr level: A = 714 ± 14mV (NTSC) A = 700 ± 14mV (PAL) Cb level: B = 714 ± 14mV (NTSC) B = 700 ± 14mV (PAL) Burst level: C = 286 ± 6mV (NTSC) C = 300 ± 6mV (PAL)

Note: The data of page: 0, address: 10 must be "00".

Switch setting:

DEMO MODE (Menu setting) ..... OFF

Adjusting method:

Order	Page	Address	Data	Procedure
1	0	01	01	Set the data.
2	3	0C	02	Set the data, and press PAUSE button.
3	C	26		Change the data and set the Cr signal level (A) to the specified value.
4	C	26		Press PAUSE button.
5	C	27		Change the data and set the Cb signal level (B) to the specified value.
6	C	27		Press PAUSE button.
7				Check that the burst signal level (C) is satisfied the specified value.
8	3	0C	00	Set the data, and press PAUSE button.
9	0	01	00	Set the data.

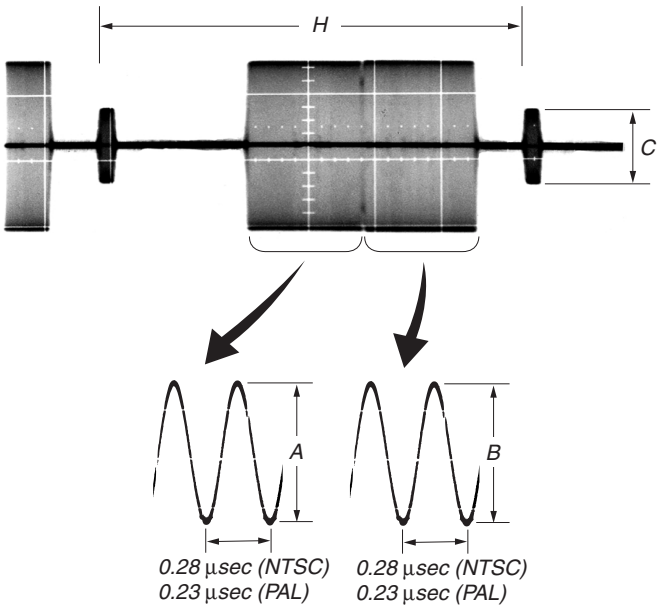


Fig. 6-3-6.

3. VIDEO OUT Y, Chroma Level Check (VC-315 Board)

Mode	Camera
Subject	Arbitrary
Measurement Point	Video terminal of AUDIO VIDEO jack (75Ω terminated)
Measuring Instrument	Oscilloscope
Specified Value	Sync level: A = 286 ± 18mV (NTSC) A = 300 ± 18mV (PAL) Burst level: B = 286 ± 18mV (NTSC) B = 300 ± 18mV (PAL)

Note: The data of page: 0, address: 10 must be “00”.

Switch setting:

DEMO MODE (Menu setting) ..... OFF

Adjusting method:

Order	Page	Address	Data	Procedure
1	3	0C	02	Set the data, and press PAUSE button.
2				Check that the sync signal level (A) satisfies the specified value.
3				Check that the burst signal level (B) satisfies the specified value.
4	3	0C	00	Set the data, and press PAUSE button.

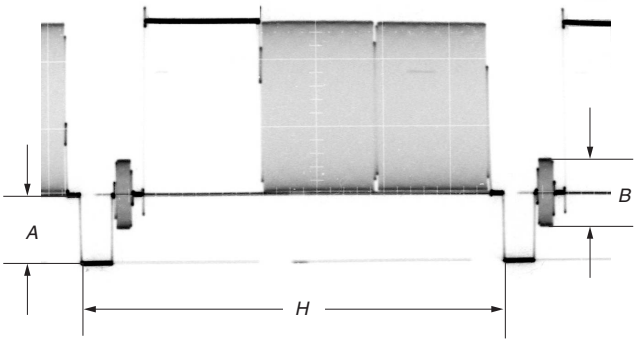


Fig. 6-3-7.

COVER

3-5. AUDIO SYSTEM ADJUSTMENTS

[Connection of Audio System Measuring Devices]

Connect the audio system measuring devices as shown in Fig. 6-3-8.

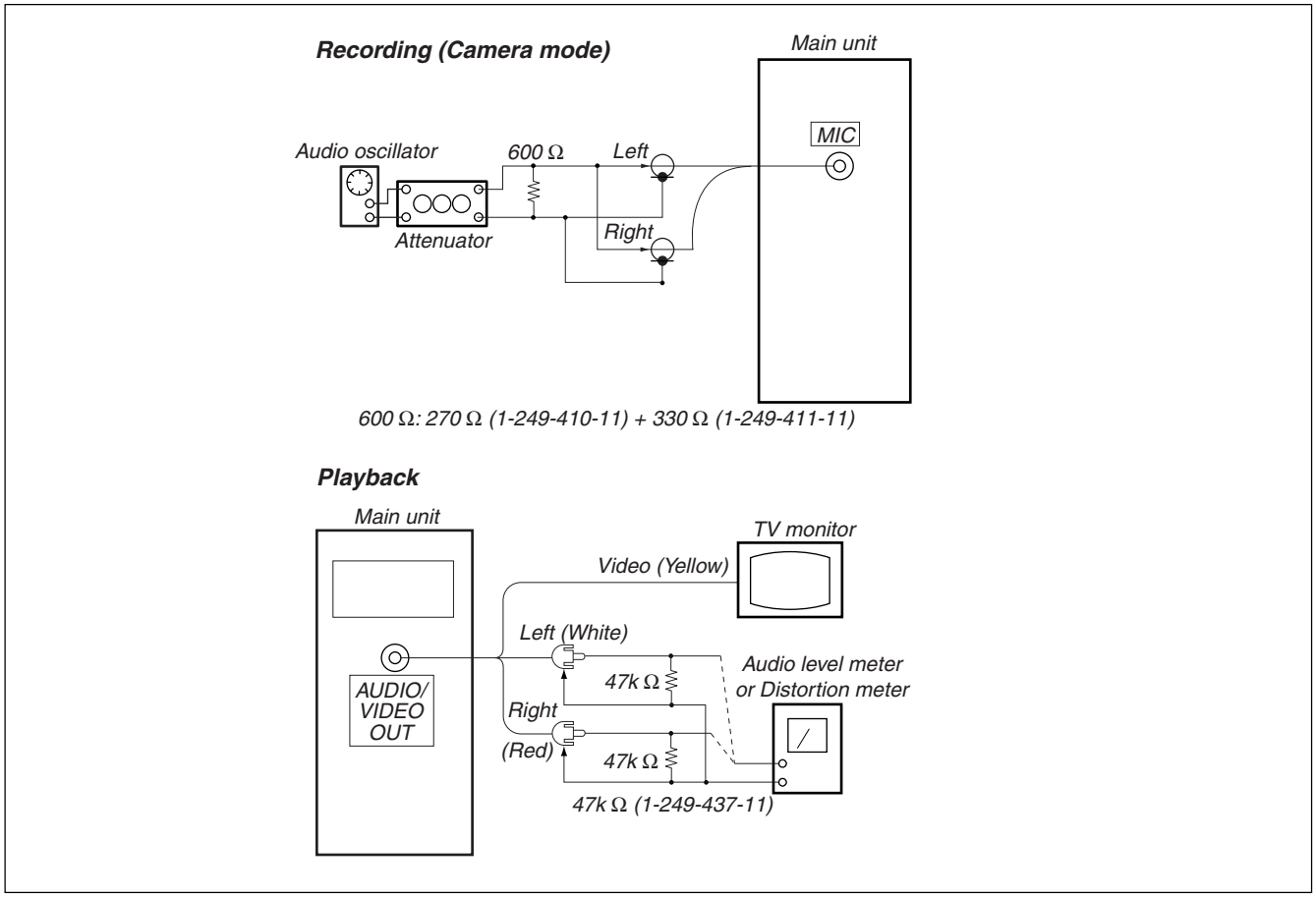


Fig. 6-3-8.

1. Playback Level Check

Mode	VTR playback
Signal	Alignment tape: For audio operation check (XH5-3 (NTSC)) (XH5-3P (PAL))
Measurement Point	Audio left or right terminal of AUDIO VIDEO jack
Measuring Instrument	Audio level meter and frequency counter
Specified Value	32 kHz mode: 1 kHz, +3.0 ± 2.0dBs 48 kHz mode: 1 kHz, +3.0 ± 2.0dBs 44.1 kHz mode: The 7.35kHz signal level during EMP OFF is +2.0 ± 2.0dBs. The 7.35kHz signal level during EMP ON is –6 ± 2 dB from the signal level during EMP OFF.

Checking Method:

1) Check that the playback signal level is the specified value.

2. Overall Level Characteristics Check

Mode	Camera recording and playback
Signal	400Hz, –66 dBs signal: MIC jack left and right
Measurement Point	Audio left or right terminal of AUDIO VIDEO jack
Measuring Instrument	Audio level meter
Specified Value	–7.5 ± 3.0dBs

Checking Method:

1) Input the 400Hz, –66dBs signal in the MIC jack.
2) Record in the camera mode.
3) Playback the recorded section.
4) Check that the 400Hz signal level is the specified value.

3. Overall Distortion Check

Mode	Camera recording and playback
Signal	400Hz, –66dBs signal: MIC jack left and right
Measurement Point	Audio left or right terminal of AUDIO VIDEO jack
Measuring Instrument	Audio distortion meter
Specified Value	Below 0.4% (200Hz to 6kHz BPF ON)

Checking Method:

1) Input the 400Hz, –66dBs signal in the MIC jack.
2) Record in the camera mode.
3) Playback the recorded section.
4) Check that the distortion is the specified value.

4. Overall Noise Level Check

Mode	Camera recording and playback
Signal	No signal: Insert a shorting plug in the MIC jack
Measurement Point	Audio left or right terminal of AUDIO VIDEO jack
Measuring Instrument	Audio level meter
Specified Value	Below –45dBs (IHF-A filter ON, 20kHz LPF ON)

Checking Method:

1) Insert a shorting plug in the MIC jack.
2) Record in the camera mode.
3) Playback the recorded section.
4) Check that the noise level is the specified value.

5. Overall Separation Check

Mode	Camera recording and playback
Signal	400Hz, –66dBs signal: MIC jack <right> [left] (Connect the MIC jack <left> [right] to GND)
Measurement Point	Audio <left> [right] terminal of AUDIO VIDEO jack
Measuring Instrument	Audio level meter
Specified Value	Below –40dBs (IHF-A filter ON)

< > : Left channel check
[ ] : Right channel check

Checking Method:

1) Input the 400Hz, –66dBs signal in the <right> [left] terminal of the MIC jack only.
2) Record in the camera mode.
3) Playback the recorded section.
4) Check that the signal level of the audio <left> [right] terminal is the specified value.

COVER

6-4. SERVICE MODE

4-1. ADJUSTMENT REMOTE COMMANDER

The adjustment remote commander is used for changing the calculation coefficient in signal processing, EVR data, etc. The adjustment remote commander performs bi-directional communication with the unit using the remote commander signal line (LANC). The resultant data of this bi-directional communication is written in the non-volatile memory.

1. Using the adjustment remote commander

1) Connect the adjustment remote commander to the LANC terminal.
2) Set the HOLD switch of the adjustment remote commander to "HOLD" (SERVICE position). If it has been properly connected, the LCD on the adjustment remote commander will display as shown in Fig. 6-4-1.

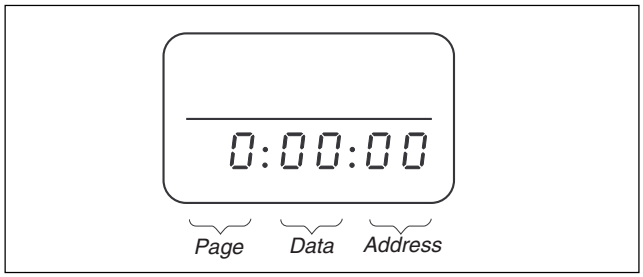


Fig. 6-4-1

3) Operate the adjustment remote commander as follows.
   - Changing the page
     The page increases when the EDIT SEARCH+ button is pressed, and decreases when the EDIT SEARCH– button is pressed. There are altogether 21 pages, from 0 to F, 18, 1B, 1C, 1E, 1F. (Note)

Hexadecimal notation	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
LCD Display	0	1	2	3	4	5	6	7	8	9	A	b	c	d	E	F
Decimal notation conversion value	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15

   - Changing the address
     The address increases when the FF (►►) button is pressed, and decreases when the REW (◄◄) button is pressed. There are altogether 256 addresses, from 00 to FF.
   - Changing the data (Data setting)
     The data increases when the PLAY (►) button is pressed, and decreases when the STOP (■) button is pressed. There are altogether 256 data, from 00 to FF.
   - Writing the adjustment data
     The PAUSE button must be pressed to write the adjustment data (8, A, B, C, D, E, F, 18, 1B, 1C, 1E, 1F page) in the nonvolatile memory. (The new adjusting data will not be recorded in the nonvolatile memory if this step is not performed.)
4) After completing all adjustments, turn off the main power supply once.

Note: When reading or writing the 18, 1B, 1C, 1E, 1F page data, select page: 0, address: 10, and set data: 01, then select 8, B, C, E or F page. The 18, 1B, 1C, 1E or 1F page can be chosen by this data setting.
After reading or writing, reset the data of page: 0, address: 10 to "00".

2. Precautions upon using the adjustment remote commander

Mishandling of the adjustment remote commander may erase the correct adjustment data at times. To prevent this, it is recommended that all adjustment data be noted down before beginning adjustments and new adjustment data after each adjustment.

COVER

4-2. DATA PROCESS

The calculation of the DDS display and the adjustment remote commander display data (hexadecimal notation) are required for obtaining the adjustment data of some adjustment items. In this case, after converting the hexadecimal notation to decimal notation, calculate and convert the result to hexadecimal notation, and use it as the adjustment data. Indicates the hexadecimal-decimal conversion table.

Hexadecimal-decimal Conversion Table

	Lower digit of hexadecimal / Upper digit of hexadecimal	0	1	2	3	4	5	6	7	8	9	A (A)	B (b)	C (c)	D (d) ②	E (E)	F (F)
	0	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
	1	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31
	2	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47
	3	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63
	4	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79
	5	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95
	6	96	97	98	99	100	101	102	103	104	105	106	107	108	109	110	111
	7	112	113	114	115	116	117	118	119	120	121	122	123	124	125	126	127
	8	128	129	130	131	132	133	134	135	136	137	138	139	140	141	142	143
	9	144	145	146	147	148	149	150	151	152	153	154	155	156	157	158	159
	A (A)	160	161	162	163	164	165	166	167	168	169	170	171	172	173	174	175
①	B (b)	176	177	178	179	180	181	182	183	184	185	186	187	188	189	190	191
	C (c)	192	193	194	195	196	197	198	199	200	201	202	203	204	205	206	207
	D (d)	208	209	210	211	212	213	214	215	216	217	218	219	220	221	222	223
	E (E)	224	225	226	227	228	229	230	231	232	233	234	235	236	237	238	239
	F (F)	240	241	242	243	244	245	246	247	248	249	250	251	252	253	254	255

Note : The characters shown in the parenthesis ( ) shown the display on the adjustment remote commander.

(Example) If the DDS display or the adjustment remote commander shows BD (bd);
Because the upper digit of the adjustment number is B (b), and the lower digit is D (d), the meeting point "189" of ① and ② in the above table is the corresponding decimal number.

Table. 6-4-1.

COVER

4-3. SERVICE MODE

Note: Before performing the adjustments, check the data of page: 0, address: 10 is “00”. If not, set data: 00 to this address.

1. Setting the Test Mode

Page D	Address 10

Data	Function
00	Normal
01	Forced camera power ON
02	Forced VTR power ON
03	Forced camera + VTR power ON
05	Forced memory power ON

- Before setting the data , select page: 0, address: 01, and set data: 01.
- For page D, the data set is recorded in the non-volatile memory by pressing the PAUSE button of the adjustment remote commander. In this case, take note that the test mode will not be exited even when the main power is turned off.
- After completing adjustments/repairs, be sure to return the data of this address to 00, and press the PAUSE button of the adjustment remote commander.
  Select page: 0, address: 01, and set data: 00.

2. Emergence Memory Address

Page C	Address F4 to FF

Address	Contents
F4	EMG code when first error occurs
F6	Upper: MSW code when shift starts when first error occurs Lower: MSW code when first error occurs
F7	Lower: MSW code to be moved when first error occurs
F8	EMG code when second error occurs
FA	Upper: MSW code when shift starts when second error occurs Lower: MSW code when second error occurs
FB	Lower: MSW code to be moved when second error occurs
FC	EMG code when last error occurs
FE	Upper: MSW code when shift starts when last error occurs Lower: MSW code when last error occurs
FF	Lower: MSW code to be moved when last error occurs

When no error occurs in this unit, data “00” is written in the above addresses (F4 to FF). when first error occurs in the unit, the data corresponding to the error is written in the first emergency address (F4 to F7). In the same way, when the second error occurs, the data corresponding to the error is written in the second emergency address (F8 to FB). Finally, when the last error occurs, the data corresponding to the error is written in the last emergency address (FC to FF).

Note: After completing adjustments, be sure to initialize the data of addresses F4 to FF to “00”.

Initializing method:

1) Select page: 0, address: 01, and set data: 01.
2) Select page: 3, address: 01, set data: 37, and press the PAUSE button.
3) Check that the data of page:3, address:02 is “00”.
4) Select page: 0, address: 01, and set data: 00.

2-1. EMG Code (Emergency Code)

Codes corresponding to the errors which occur are written in addresses F4, F8 and FC. The type of error indicated by the code are shown in the following table.

Code	Emergency Type
00	No error
10	Loading motor emergency during loading
11	Loading motor emergency during unloading
22	T reel emergency during normal rotation
23	S reel emergency during normal rotation
24	T reel emergency (Short circuit between S reel terminal and T reel terminal)
30	FG emergency at the start up of the capstan
40	FG emergency at the start up of the drum
42	FG emergency during normal rotation of the drum

2-2. MSW Code

MSW when errors occur:

Information on MSW (mode SW) when errors occur

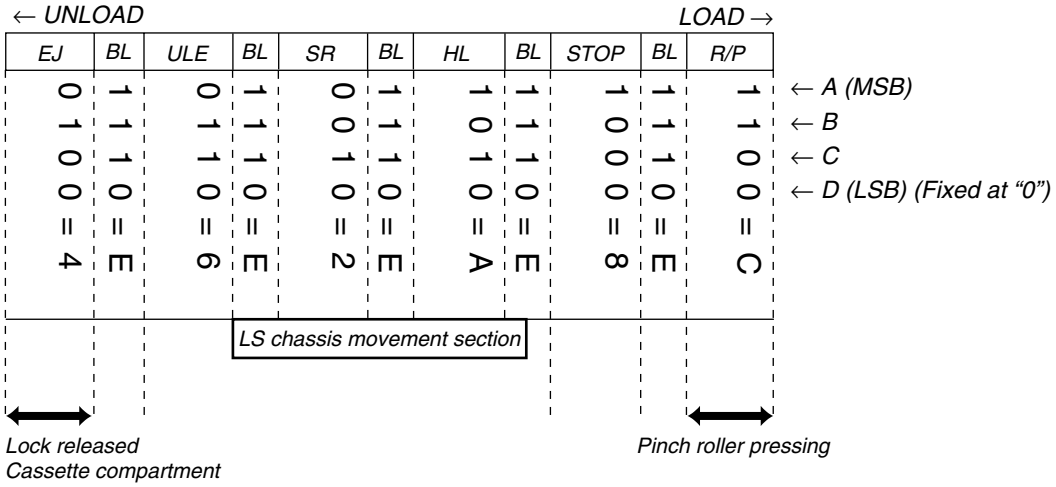
MSW when movement starts:

Information on MSW when movements starts when the mechanism position is moved (When the L motor is moved)

MSW of target of movement:

Information on target MSW of movement when the mechanism position is moved

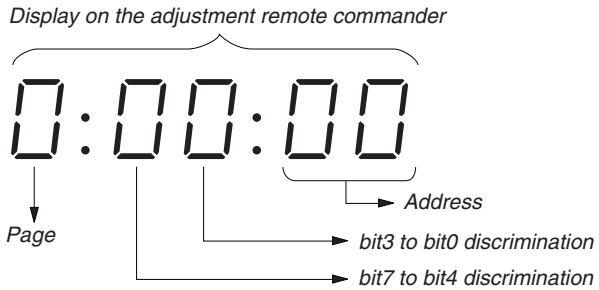
Mechanical Position



Position	Code	Contents
EJ	4	Position at which the cassette component lock is released, at the farthest unload side mechanically at which the mechanism can move no further in the UNLOAD direction.
BL	E	BLANK code, at the boundary between codes.
ULE	6	EJECT completion position. when the cassette is ejected, the mechanism will stop at this position. Cassette IN standby. The guide will start protruding out as the mechanism moves towards the LOAD position.
SR	2	Position at which it is possible to release the S ratchet.
HL	A	Guide loading are performed here.
STOP	8	Stop position in the loading state. The pinch roller separates, the tension regulator returns, and the brake is imposed on both reels.
R/P	C	PB, REC, CUE, REVIEW, PAUSE, FF, REW positions. When pinch roller is pressed, and the tension regulator is ON, the mechanism is operating at this position in modes in which normal images are shown.
NULL	0	Code not existing in the MD. Default value.
	F	Status before finding any mechanism position.

3. Bit value discrimination

Bit values must be discriminated using the display data of the adjustment remote commander for following items. Use the table below to discriminate if the bit value is "1" or "0".



	Display on the adjustment remote commander	Bit values			
		bit3 or bit7	bit2 or bit6	bit1 or bit5	bit0 or bit4
	0	0	0	0	0
	1	0	0	0	1
	2	0	0	1	0
	3	0	0	1	1
	4	0	1	0	0
	5	0	1	0	1
	6	0	1	1	0
	7	0	1	1	1
Ⓐ	8	1	0	0	0
	9	1	0	0	1
	A (A)	1	0	1	0
	B (b)	1	0	1	1
	C (c)	1	1	0	0
	D (d)	1	1	0	1
Ⓑ	E (E)	1	1	1	0
	F (F)	1	1	1	1

Example: If "8E" is displayed on the adjustment remote commander, the bit values for bit7 to bit4 are shown in the Ⓐ column, and the bit values for bit3 to bit0 are shown in the Ⓑ column.

4. Switch check (1)

Page 7	Address 0E

Note: The data of page: 0, address: 10 must be "00".

Bit	Function	When bit value=1	When bit value=0
0	POWER SW (XVTR MODE SW) (PS-2890 block S003)	ON (VCR)	OFF
1	POWER SW (XCAM MODE SW) (PS-2890 block S002)	ON (CAMERA)	OFF
2	DISPLAY/BATTERRY INFO SW (XBATT VIEW SW) (CK-131 board S5203)	ON	OFF
3	EJECT SW (XEJECT SW) (FP-645 flexible S001)	ON	OFF
4	CC DOWN SW (Mechanism chassis)	ON (DOWN)	OFF (UP)
5	PHOTO SW (PHOTO FREEZE) SW (FK-4300 block S8003)	ON	OFF
6	POWER SW (XPHOTO STBY SW) (PS-2890 block S004)	ON (MEMORY)	OFF
7			

Using method:

1) Select page: 7, address: 0E.
2) By discriminating the bit value of display data, the state of the switch can be discriminated.

5. Switch check (2)

Page 7	Address 0C

Note: The data of page: 0, address: 10 must be "00".

Bit	Function	When bit value=1	When bit value=0
1	MIC jack (JK-249 board J5101)	Used	Not used
2	AUDIO/VIDEO jack (JK-248 board J5002)	Used	Not used
3	S VIDEO jack (JK-248 board J5002)	Used	Not used

Using method:

1) Select page: 7, address: 0C.
2) By discriminating the bit value of display data, the state of the switch can be discriminated.

6. Switch check (3)

Page 3	Address 61

Note: The data of page: 0, address: 10 must be “00”.

Bit	Function	When bit value=1	When bit value=0
6	HEADPHONS jack (JK-248 board J5003)	Used	Not used

Using method:

1) Select page: 3, address: 61.
2) By discriminating the bit value of display data, the state of the switch can be discriminated.

7. Switch check (4)

Page 2	Address 60 to 63, 67

Note: The data of page: 0, address: 10 must be “00”.

Using method:

1) Select page: 2, address: 61 to 63, 67.
2) By discriminating the display data, the pressed key can be discriminated.

Address	Data			
	00 (00 to 0C)	19 (0D to 24)	32 (25 to 3F)	EB (D8 to FF)
61 (KEY AD1) (IC3102 ⑥⓪)	EDIT SEARCH – (FK-4300 block, S8001)	EDIT SEARCH + (FK-4300 block, S8002)	PHOTO (PHOTO REC) (FK-4300 block, S8004)	No key input
62 (KEY AD2) (IC3102 ⑥①)	BACK LIGHT (FP-635 flexible, S001)	FOCUS (FP-635 flexible, S002)	PANEL CLOSE (CK-131 board, S5201)	PANEL OPEN (CK-131 board, S5201)
63 (KEY AD3) (IC3102 ⑥⑤)	PANEL REVERSE (FP-461 flexible, S001)			PANEL NORMAL (FP-461 flexible, S001)
67 (KEY AD7) (IC3102 ⑥⑨)	START/STOP (PS-2890 block S001)			No key input

8. LED check

Page 7	Address 07	Bit4, Bit5

Note: The data of page: 0, address: 10 must be “00”.

Using method:

1) Select page: 7, address: 07, and set data: 10. (Bit4=1)
2) Check that all segments of LCD (display window) are lit.
3) Select page: 7, address: 07, and set data: 20. (Bit5=1)
4) Check that LED (Recording lamp) is lit.
5) Select page: 7, address: 07, and set data: 00. (Bit4=0, Bit5=0).

9. Record of Use check (1)

Page 7	Address A7 to A9

Note1: When replacing the drum assembly or the mechanism deck, initialize the data of address: A7 to A9.
Note2: This data will be kept even if the lithium battery (CK-131 board BT5201 of the cabinet (R) assembly) is removed.
Note3: The data of page: 0, address: 10 must be “00”.

Address	Function		Remarks
A7	Drum rotation	Hour (H)	100000th place digit and 10000th place digit of counted time
A8	counted time	Hour (M)	1000th place digit and 100th place digit of counted time
A9	(BCD code)	Hour (L)	10th place digit and 1st place digit of counted time

Using method:

1) The record of use data is displayed at addresses: A7 to A9.

Initializing method:

1) Select page: 7, address: 00, and set data: 71.
2) Select page: 7, address: 01, set data: 71 and press the PAUSE button.
3) Check that the data of page: 7, address: 02 is “00”.

10. Record of Use check (2)

Page 7	Address C8 to CD

Note1: This data will be kept even if the lithium battery (CK-131 board BT5201 of the cabinet (R) assembly) is removed.
Note2: The data of page: 0, address: 10 must be “00”.

Address	Function		Remarks
C8	User initial power	Year	After setting the clock, set the date of power on next
C9	on date	Month	
CA	(BCD code)	Day	
CB	Final condensation	Year	
CC	occurrence data	Month	
CD	(BCD code)	Day	

Using method:

1) The record of use data is displayed at addresses: C8 to CD.

11. Record of Self-diagnosis check

Page 7	Address B0 to C6

Note1: This data will be kept even if the lithium battery (CK-131 board BT5201 of the cabinet (R) assembly) is removed.
Note2: The data of page: 0, address: 10 must be “00”.

Address	Self-diagnosis code
B0	“Repaired by” code (Occurred 1st time) *1
B1	“Block function” code (Occurred 1st time)
B2	“Detailed” code (Occurred 1st time)
B4	“Repaired by” code (Occurred 2nd time) *1
B5	“Block function” code (Occurred 2nd time)
B6	“Detailed” code (Occurred 2nd time)
B8	“Repaired by” code (Occurred 3rd time) *1
B9	“Block function” code (Occurred 3rd time)
BA	“Detailed” code (Occurred 3rd time)
BC	“Repaired by” code (Occurred 4th time) *1
BD	“Block function” code (Occurred 4th time)
BE	“Detailed” code (Occurred 4th time)
C0	“Repaired by” code (Occurred 5th time) *1
C1	“Block function” code (Occurred 5th time)
C2	“Detailed” code (Occurred 5th time)
C4	“Repaired by” code (Occurred the last time) *1
C5	“Block function” code (Occurred the last time)
C6	“Detailed” code (Occurred the last time)

*1: “01” → “C”, “03” → “E”

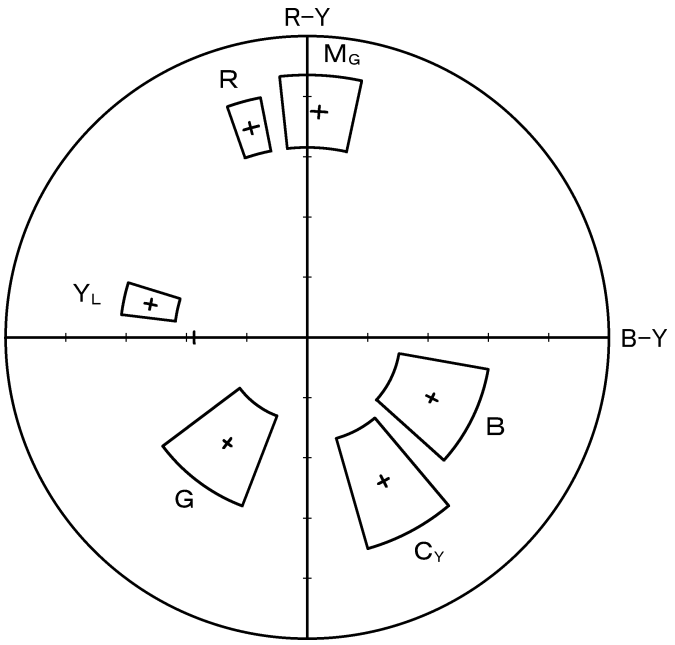
Using method:

1) The past self-diagnosis codes are displayed at addresses: BC to C6.
   Refer to “SELF-DIAGNOSIS FUNCTION” for detail of the self-diagnosis code except for the code being written in the following table.

Self-diagnosis Code			Symptom/State	Correction
Repaired by:	Block Function	Detailed Code		
E	20	00	Data on A page or D page are rewritten.	Make data on A page and D page correct value.

〈FOR CAMERA COLOR REPRODUCTION ADJUSTMENT〉

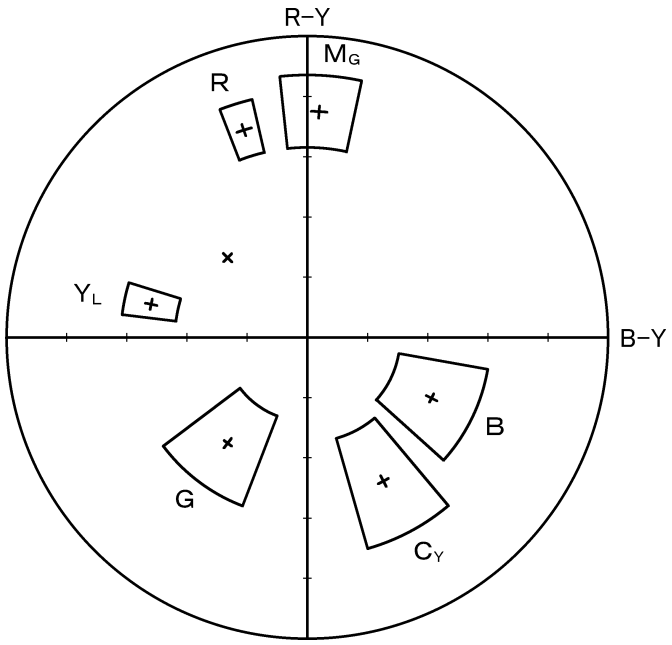
For NTSC model



DCR-TRV38/TRV39

Take a copy of CAMERA COLOR REPRODUCTION FRAME with a clear sheet for use.

For PAL model



DCR-TRV38E

DCR-TRV38/TRV38E/TRV39

RMT-814

SERVICE MANUAL

LEVEL 2

Ver 1.0 2003. 02

Revision History

Photo : DCR-TRV38

US Model
Canadian Model
DCR-TRV38/TRV39
E Model
Hong Kong Model
Tourist Model
DCR-TRV38/TRV38E
Korea Model
DCR-TRV38
Chinese Model
DCR-TRV38E

Z MECHANISM

Link

SPECIFICATIONS	BLOCK DIAGRAMS	PRINTED WIRING BOARDS
SERVICE NOTE	FRAME SCHEMATIC DIAGRAMS	REPAIR PARTS LIST
DISASSEMBLY	SCHEMATIC DIAGRAMS	

- For ADJUSTMENTS (SECTION 6), refer to SERVICE MANUAL, ADJ (987623051.pdf).
- For INSTRUCTION MANUAL, refer to SERVICE MANUAL, LEVEL 1 (987623041.pdf).
- For MECHANISM ADJUSTMENTS, refer to the "DV MECHANICAL ADJUSTMENT MANUAL Ⅶ Z MECHANISM" (9-876-210-11).
- Reference No. search on printed wiring boards is available.

On the VC-315 board

This service manual provides the information that is premised the circuit board replacement service and not intended repair inside the VC-315 board.

Therefore, schematic diagram, printed wiring board, waveforms, mounted parts location and electrical parts list of the VC-315 board is not shown.

The following pages are not shown.

Schematic diagram ..... Pages 4-33 to 4-66
Printed wiring board ..... Pages 4-87 to 4-94
Waveforms ..... Pages 4-97 to 4-98
Mounted parts location ..... Pages 4-101 to 4-102
Electrical parts list ..... Pages 5-19 to 5-27

Mini DV Digital Video Cassette

DIGITAL VIDEO CAMERA RECORDER

SONY

COVER

Self Diagnosis Supported model

Digital Handycam

Network Handycam

InfoLITHIUM M SERIES

Cassette Memory

MEMORY STICK

SPECIFICATIONS

Video camera recorder

System

Video recording system
2 rotary heads
Helical scanning system
Audio recording system
Rotary heads, PCM system
Quantization: 12 bits (Fs 32 kHz, stereo 1, stereo 2), 16 bits (Fs 48 kHz, stereo)
Video signal
DCR-TRV38/TRV39:
NTSC color, EIA standards
DCR-TRV38E:
PAL colour, CCIR standards
Usable cassette
Mini DV cassette with the Mini DV mark printed
Tape speed
SP: Approx. 18.81 mm/s
LP: Approx. 12.56 mm/s
Recording/playback time (using cassette DVM60)
SP: 1 hour
LP: 1.5 hours
Fastforward/rewind time (using cassette DVM60)
Approx. 2 min. and 40 seconds
Viewfinder
Electric viewfinder (color)
Image device
3.8 mm (1/4.7 type) CCD (Charge Coupled Device)
Gross: Approx. 1 070 000 pixels
Effective (still):
Approx. 1 000 000 pixels
Effective (moving):
Approx. 690 000 pixels
Lens
Carl Zeiss Vario-Sonnar
Combined power zoom lens
Filter diameter: 30 mm (1 3/16 in)
10×(Optical), 120×(Digital)
F = 1.8 – 2.0
Focal length
3.7 – 37 mm (5/32 – 1 1/2 in.)
When converted to a 35 mm still camera
In CAMERA:
50 – 500 mm (2 – 19 3/4 in.)
In MEMORY:
42 – 420 mm (1 11/16 – 16 5/8 in.)
Color temperature
Auto, HOLD, INDOOR (3 200 K), OUTDOOR (5 800 K)
Minimum illumination
7 lx (lux) (F 1.8)
0 lx (lux) (in NightShot)*
* Objects unable to be seen due to the dark can be shot with infrared lighting.

Input/Output connectors

S video input/output
4-pin mini DIN
Luminance signal: 1 Vp-p, 75 Ω (ohms), unbalanced
DCR-TRV38/TRV39:
Chrominance signal: 0.286 Vp-p, 75 Ω (ohms), unbalanced
DCR-TRV38E:
Chrominance signal: 0.3 Vp-p, 75 Ω (ohms), unbalanced
Audio/Video input/output
AV MINI JACK, 1 Vp-p, 75 Ω (ohms), unbalanced
327 mV, (at output impedance more than 47 kΩ (kilohms))
Output impedance with less than 2.2 kΩ (kilohms)/Stereo minijack (ø 3.5 mm)
Input impedance more than 47 kΩ (kilohms)
DV input/output
4-pin connector
Headphone jack
Stereo minijack (ø 3.5 mm)
LANC jack
Stereo mini-minijack (ø 2.5 mm)
USB jack
DCR-TRV38/TRV38E:
mini-B
DCR-TRV39:
mini-AB
MIC jack
Minijack, 0.388 mV low impedance with 2.5 to 3.0 V DC, output impedance 6.8 k Ω(kilohms) (ø 3.5 mm)
Stereo type

LCD screen

Picture
8.8 cm (3.5 type)
Total dot number
184 000 (840 × 220)

General

Power requirements
7.2 V (battery pack)
8.4 V (AC Adaptor)
Average power consumption (when using the battery pack)
During camera recording using LCD
DCR-TRV38/TRV38E: 4.3 W
DCR-TRV39: 4.4 W
Viewfinder
DCR-TRV38/TRV38E: 3.2 W
DCR-TRV39: 3.3 W
Operating temperature
0°C to 40°C (32°F to 104°F)
Storage temperature
–20°C to + 60°C
(–4°F to + 140°F)
Dimensions (approx.)
72 × 91 × 161 mm
(2 7/8 × 3 5/8 × 6 3/8 in.) (w/h/d)
Mass (approx.)
660 g (1 lb 7 oz)
main unit only
750 g (1 lb 10 oz)
including the rechargeable battery pack NP-FM30, cassette DVM60 and lens cap
Supplied accessories
See page 3.

AC Adaptor AC-L15A/L15B

Power requirements
100 – 240 V AC, 50/60 Hz
Current consumption
0.35 – 0.18 A
Power consumption
18 W
Output voltage
DC OUT: 8.4 V, 1.5 A
Operating temperature
0°C to 40°C (32°F to 104°F)
Storage temperature
–20°C to + 60°C
(–4°F to + 140°F)
Dimensions (approx.)
56 × 31 × 100 mm
(2 1/4 × 1 1/4 × 4 in.) (w/h/d)
excluding projecting parts
Mass (approx.)
190 g (6.7 oz)
excluding power cord

Rechargeable battery pack NP-FM30

Maximum output voltage
DC 8.4 V
Output voltage
DC 7.2 V
Capacity
5.0 Wh (700 mAh)
Dimensions (approx.)
38.2 × 20.5 × 55.6 mm
(1 9/16 × 13/16 × 2 1/4 in.)
(w/h/d)
Mass (approx.)
65 g (2.3 oz)
Type
Lithium ion

"Memory Stick"

Memory
Flash memory
8MB: MSA-8A
Operating voltage
2.7 – 3.6 V
Power consumption
Approx. 45 mA during operation mode
Approx. 130 µA during tape recording standby
Dimensions (approx.)
50 × 2.8 × 21.5 mm
(2 × 1/8 × 7/8 in.) (w/h/d)
Mass (approx.)
4 g (0.14 oz)

Design and specifications are subject to change without notice.

CAUTION :
Danger of explosion if battery is incorrectly replaced.
Replace only with the same or equivalent type.

SAFETY-RELATED COMPONENT WARNING!!

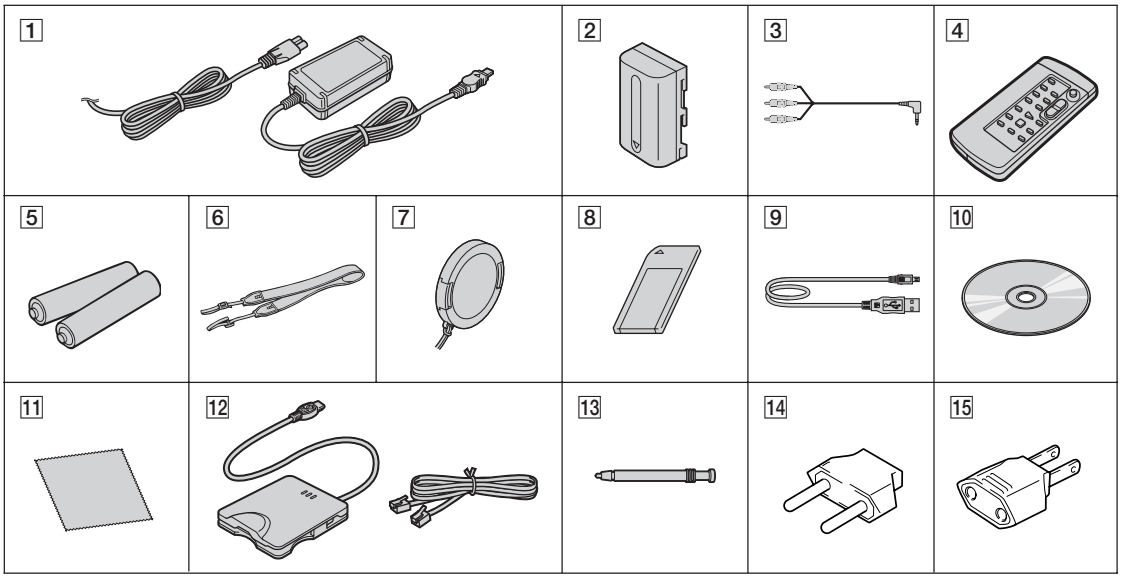
COMPONENTS IDENTIFIED BY MARK ⚠ OR DOTTED LINE WITH MARK ⚠ ON THE SCHEMATIC DIAGRAMS AND IN THE PARTS LIST ARE CRITICAL TO SAFE OPERATION. REPLACE THESE COMPONENTS WITH SONY PARTS WHOSE PART NUMBERS APPEAR AS SHOWN IN THIS MANUAL OR IN SUPPLEMENTS PUBLISHED BY SONY.

ATTENTION AU COMPOSANT AYANT RAPPORT À LA SÉCURITÉ!

LES COMPOSANTS IDENTIFÉS PAR UNE MARQUE ⚠ SUR LES DIAGRAMMES SCHÉMATIQUES ET LA LISTE DES PIÈCES SONT CRITIQUES POUR LA SÉCURITÉ DE FONCTIONNEMENT. NE REMPLACER CES COMPOSANTS QUE PAR DES PIÈSES SONY DONT LES NUMÉROS SONT DONNÉS DANS CE MANUEL OU DANS LES SUPPÉMENTS PUBLIÉS PAR SONY.

• SUPPLIED ACCESSORIES

Make sure that the following accessories are supplied with your camcorder.



1 **AC-L15A/L15B AC Adaptor** (1), **Power cord** (1)

2 **NP-FM30 rechargeable battery pack** (1)

3 **A/V connecting cable** (1.5m) (1)

4 **Wireless Remote Commander** (RMT-814E) (1)

5 **Size AA (R6) battery for Remote Commander** (2)

6 **Shoulder strap** (1)

7 **Lens cap** (1)

8 **"Memory Stick"** (MSA-8A) (1)

9 **USB cable** (1)

10 **CD-ROM (USB Driver)** (1)
SPVD-010 (DCR-TRV38:E, HK, JE, KR / TRV38E)
SPVD-010 (I) (DCR-TRV38:US, CND / TRV39

11 **Cleaning cloth** (1)

12 **UNA-PSTN Modem Adaptor** (1),
Telephone cord (1) (DCR-TRV39 only)

13 **Stylus** (1) (DCR-TRV39 only)

14 **2-pin conversion adaptor**
(DCR-TRV38:JE / TRV38E:JE only)

15 **2-pin conversion adaptor**
(DCR-TRV38:E, HK / TRV38E:E, HK)

• Abbreviation
CND : Canadian model
HK : Hong Kong model
JE : Tourist model
KR : Korea model

SAFETY CHECK-OUT

After correcting the original service problem, perform the following safety checks before releasing the set to the customer.

1. Check the area of your repair for unsoldered or poorly-soldered connections. Check the entire board surface for solder splashes and bridges.
2. Check the interboard wiring to ensure that no wires are "pinched" or contact high-wattage resistors.
3. Look for unauthorized replacement parts, particularly transistors, that were installed during a previous repair. Point them out to the customer and recommend their replacement.
4. Look for parts which, through functioning, show obvious signs of deterioration. Point them out to the customer and recommend their replacement.
5. Check the B+ voltage to see it is at the values specified.
6. Flexible Circuit Board Repairing
   - Keep the temperature of the soldering iron around 270˚C during repairing.
   - Do not touch the soldering iron on the same conductor of the circuit board (within 3 times).
   - Be careful not to apply force on the conductor when soldering or unsoldering.

Unleaded solder

Boards requiring use of unleaded solder are printed with the lead-free mark (LF) indicating the solder contains no lead.
(Caution: Some printed circuit boards may not come printed with the lead free mark due to their particular size.)

: LEAD FREE MARK

Unleaded solder has the following characteristics.

- Unleaded solder melts at a temperature about 40°C higher than ordinary solder.
  Ordinary soldering irons can be used but the iron tip has to be applied to the solder joint for a slightly longer time.
  Soldering irons using a temperature regulator should be set to about 350°C.
  Caution: The printed pattern (copper foil) may peel away if the heated tip is applied for too long, so be careful!
- Strong viscosity
  Unleaded solder is more viscous (sticky, less prone to flow) than ordinary solder so use caution not to let solder bridges occur such as on IC pins, etc.
- Usable with ordinary solder
  It is best to use only unleaded solder but unleaded solder may also be added to ordinary solder.

TABLE OF CONTENTS

1. SERVICE NOTE

1-1. SERVICE NOTE ····· 1-1
1. POWER SUPPLY DURING REPAIRS ····· 1-1
2. TO TAKE OUT A CASSETTE WHEN NOT EJECT (FORCE EJECT) ····· 1-1
1-2. SELF-DIAGNOSIS FUNCTION ····· 1-2
1. SELF-DIAGNOSIS FUNCTION ····· 1-2
2. SELF-DIAGNOSIS DISPLAY ····· 1-2
3. SELF-DIAGNOSIS CODE TABLE ····· 1-3

2. DISASSEMBLY

2-1. P CABINET (C) ASSEMBLY ····· 2-2
2-2. FRONT PANEL SECTION ····· 2-3
2-3. MA-423, SE-136 BOARD ····· 2-3
2-4. MICROPHONE ····· 2-4
2-5. CABINET (R) SECTION ····· 2-4
2-6. PANEL BLOCK ASSEMBLY ····· 2-5
2-7. PD-190 BOARD ····· 2-6
2-8. HINGE ASSEMBLY ····· 2-7
2-9. CK-131 BOARD ····· 2-7
2-10. LOUD SPEAKER, FP-635 FLEXIBLE BOARD ····· 2-8
2-11. BATTERY SECTION ····· 2-8
2-12. BATTERY TERMINAL BOARD ····· 2-9
2-13. TOP CABINET ASSEMBLY ····· 2-9
2-14. EVF SECTION ····· 2-10
2-15. VF LENS ASSEMBLY ····· 2-11
2-16. FP-435 FLEXIBLE BOARD ····· 2-12
2-17. DI-089 BOARD ····· 2-13
2-18. VC-315 BOARD ····· 2-13
2-19. MECHANISM DECK ····· 2-14
2-20. LENS SECTION ····· 2-14
2-21. JK-248, JK-249 BOARD ····· 2-15
2-22. LENS BLOCK ASSEMBLY ····· 2-17
2-23. LENS DEVICE (LSV-751A), CD-436 BOARD ····· 2-17
2-24. GRIP LOCK ASSEMBLY ····· 2-18
2-25. CS FRAME ASSEMBLY ····· 2-19
2-26. CONTROL SWITCH BLOCK (PS-2890) ····· 2-20
2-27. MEMORY STICK CONNECTOR ····· 2-20
2-28. CONTROL SWITCH BLOCK (FK-4300) ····· 2-21
2-29. CIRCUIT BOARDS LOCATION ····· 2-22
2-30. FLEXIBLE BOARDS LOCATION ····· 2-23

3. BLOCK DIAGRAMS

3-1. OVERALL BLOCK DIAGRAM (1/4) ····· 3-1
3-2. OVERALL BLOCK DIAGRAM (2/4) ····· 3-3
3-3. OVERALL BLOCK DIAGRAM (3/4) ····· 3-5
3-4. OVERALL BLOCK DIAGRAM (4/4) ····· 3-7
3-5. POWER BLOCK DIAGRAM (1/2) ····· 3-9
3-6. POWER BLOCK DIAGRAM (2/2) ····· 3-11

4. PRINTED WIRING BOARDS AND SCHEMATIC DIAGRAMS

4-1. FRAME SCHEMATIC DIAGRAM (1/3) ····· 4-1
FRAME SCHEMATIC DIAGRAM (2/3) ····· 4-3
FRAME SCHEMATIC DIAGRAM (3/3) ····· 4-5
4-2. SCHEMATIC DIAGRAMS
• CD-436 (CCD IMAGER) SCHEMATIC DIAGRAM ····· 4-9
• LB-087 (EVF, BACKLIGHT) SCHEMATIC DIAGRAM ····· 4-10
• DI-089 (1/3)(CHARGE, POWER IN) SCHEMATIC DIAGRAM ····· 4-11
• DI-089 (2/3)(EVF DRIVER, TIMING GEN.) SCHEMATIC DIAGRAM ····· 4-13
• DI-089 (3/3)(DC-DC CONVERTER) SCHEMATIC DIAGRAM ····· 4-15
• PD-190 (1/2)(LCD DRIVER, TIMING GEN.) SCHEMATIC DIAGRAM ····· 4-17
• PD-190 (2/2)(LCD BACKLIGHT) SCHEMATIC DIAGRAM ····· 4-19
• MA-423 (MIC IN, A/V-IN) SCHEMATIC DIAGRAM ····· 4-21
• JK-248 (P/Y SENSOR, A/V-IN) SCHEMATIC DIAGRAM ····· 4-23
• FP-639 FLEXIBLE SCHEMATIC DIAGRAM ····· 4-23
• JK-249 (MIC IN, DV IN/OUT) SCHEMATIC DIAGRAM ····· 4-25
• CK-131 (FUNCTION KEY) SCHEMATIC DIAGRAM ····· 4-27
• CONTROL SWITCH BLOCK (FK4300) SCHEMATIC DIAGRAM ····· 4-29
• FP-467/468/228 FLEXIBLE (S/T REEL SENSOR, TAPE SENSOR) SCHEMATIC DIAGRAM ····· 4-31

Shematic diagram of the VC-315 board are not shown.
Pages from 4-33 to 4-66 are not shown.

4-3. PRINTED WIRING BOARDS
• CD-436 (CCD IMAGER) PRINTED WIRING BOARD ····· 4-69
• LB-087 (EVF, BACKLIGHT) PRINTED WIRING BOARD ····· 4-69
• MA-423 (MIC IN, REMOCON REC) PRINTED WIRING BOARD ····· 4-69
• DI-089 (CHARGE, POWER IN, EVF DRIVER, TIMING GEN., DC-DC CONVERTER) PRINTED WIRING BOARD ····· 4-71
• PD-190 (LCD DRIVER, TIMIN GEN., LCD BACKLIGHT) PRINTED WIRING BOARD ····· 4-75
• MA-423 (MIC IN, REMOCON REC) PRINTED WIRING BOARD ····· 4-77
• JK-248 (P/Y SENSOR, A/V-IN) PRINTED WIRING BOARD ····· 4-79
• JK-249 (MIC IN, DV IN/OUT) PRINTED WIRING BOARD ····· 4-81
• CK-131 (FUNCTION KEY) PRINTED WIRING BOARD ····· 4-83
• FP-467, FP-468, FP-228 FLEXIBLE BOARD ····· 4-83

Printed wiring board of the VC-315 board are not shown.
Pages from 4-87 to 4-94 are not shown.

4-4. WAVEFORMS ····· 4-95

Waveforms of the VC-315 board are not shown.
Pages from 4-97 to 4-98 are not shown.

4-5. MOUNTED PARTS LOCATION ····· 4-99

Mounted parts location of the VC-315 board is not shown.
Pages from 4-101 to 4-102 are not shown.

5. REPAIR PARTS LIST

5-1. EXPLODED VIEWS ····· 5-1
5-1-1. OVERALL ····· 5-3
5-1-2. CABINET (R) SECTION ····· 5-4
5-1-3. PANEL BLOCK SECTION ····· 5-5
5-1-4. CABINET (L) SECTION-1 ····· 5-6
5-1-5. CABINET (L) SECTION-2 ····· 5-7
5-1-6. EVF SECTION ····· 5-8
5-1-7. LENS SECTION ····· 5-9
5-1-8. OVERALL (MECHANISM DECK-Z100) ····· 5-10
5-1-9. LS CHASSIS BLOCK ASSEMBLY ····· 5-11
5-1-10. MECHANICAL CHASSIS BLOCK ASSEMBLY ··· 5-12
5-2. ELECTRICAL PARTS LIST ····· 5-13

Parts list of the VC-315 board are not shown.
Pages from 5-19 to 5-27 are not shown.

COVER

SECTION 1
SERVICE NOTE

1-1. SERVICE NOTE

1. POWER SUPPLY DURING REPAIRS

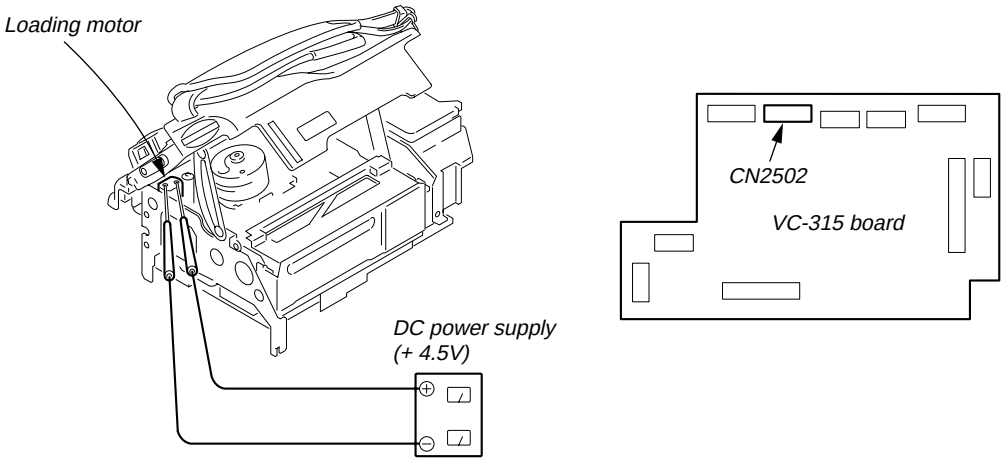
In this unit, about 10 seconds after power is supplied to the battery terminal using the regulated power supply (8.4V), the power is shut off so that the unit cannot operate.
This following two methods are available to prevent this. Take note of which to use during repairs.

Method 1:
Use the AC power adaptor (AC-L15, AC-VQ800 etc.).

Method 1:
Connect the servicing remote commander RM-95 (J-6082-053-B) to the LANC jack, and set the commander switch to the "ADJ" side.

2. TO TAKE OUT A CASSETTE WHEN NOT EJECT (FORCE EJECT)

① Refer to 2-2 to remove the front panel assembly.
② Refer to 2-13 to remove the top cabinet assembly.
③ Refer to 2-5 to remove the cabinet (R) assembly.
④ Refer to 2-11 to remove the battery panel section.
⑤ Remove the EVF block.
⑥ Open the DI-089 board.
⑦ Disconnect CN2502 (27P, 0.3mm) of VC-315 board.
⑧ Open the cassette lid.
⑨ Supply +4.5V from the DC power supply to the loading motor and unload with a pressing the cassette compartment.

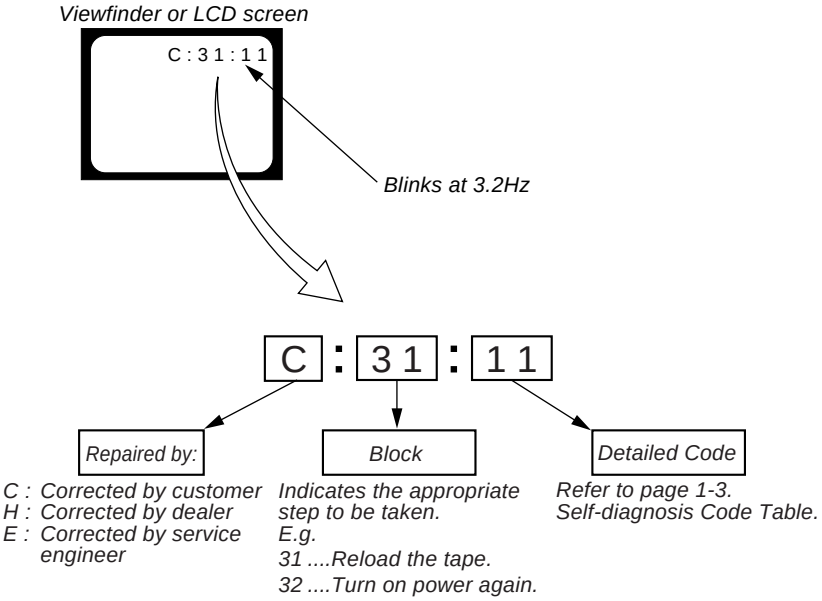


1-2. SELF-DIAGNOSIS FUNCTION

1. SELF-DIAGNOSIS FUNCTION

When problems occur while the unit is operating, the self-diagnosis function starts working, and displays on the viewfinder, or LCD screen what to do. This function consists of two display; self-diagnosis display and service mode display.

Details of the self-diagnosis functions are provided in the Instruction manual.


Viewfinder or LCD screen
C : 3 1 : 1 1
Blinks at 3.2Hz
C : 3 1 : 1 1
Repaired by:
Block
Detailed Code
C : Corrected by customer
H : Corrected by dealer
E : Corrected by service engineer
Indicates the appropriate step to be taken.
E.g.
31 ....Reload the tape.
32 ....Turn on power again.
Refer to page 1-3.
Self-diagnosis Code Table.

2. SELF-DIAGNOSIS DISPLAY

When problems occur while the unit is operating, the counter of the viewfinder or LCD screen consists of an alphabet and 4-digit number, which blinks at 3.2Hz. This 5-character display indicates the “repaired by:”, “block” in which the problem occurred, and “detailed code” of the problem.

Note: The self-diagnosis display data will be kept even if the lithium battery (BT5201 of CK-131 board) is removed.

3. SELF-DIAGNOSIS CODE TABLE

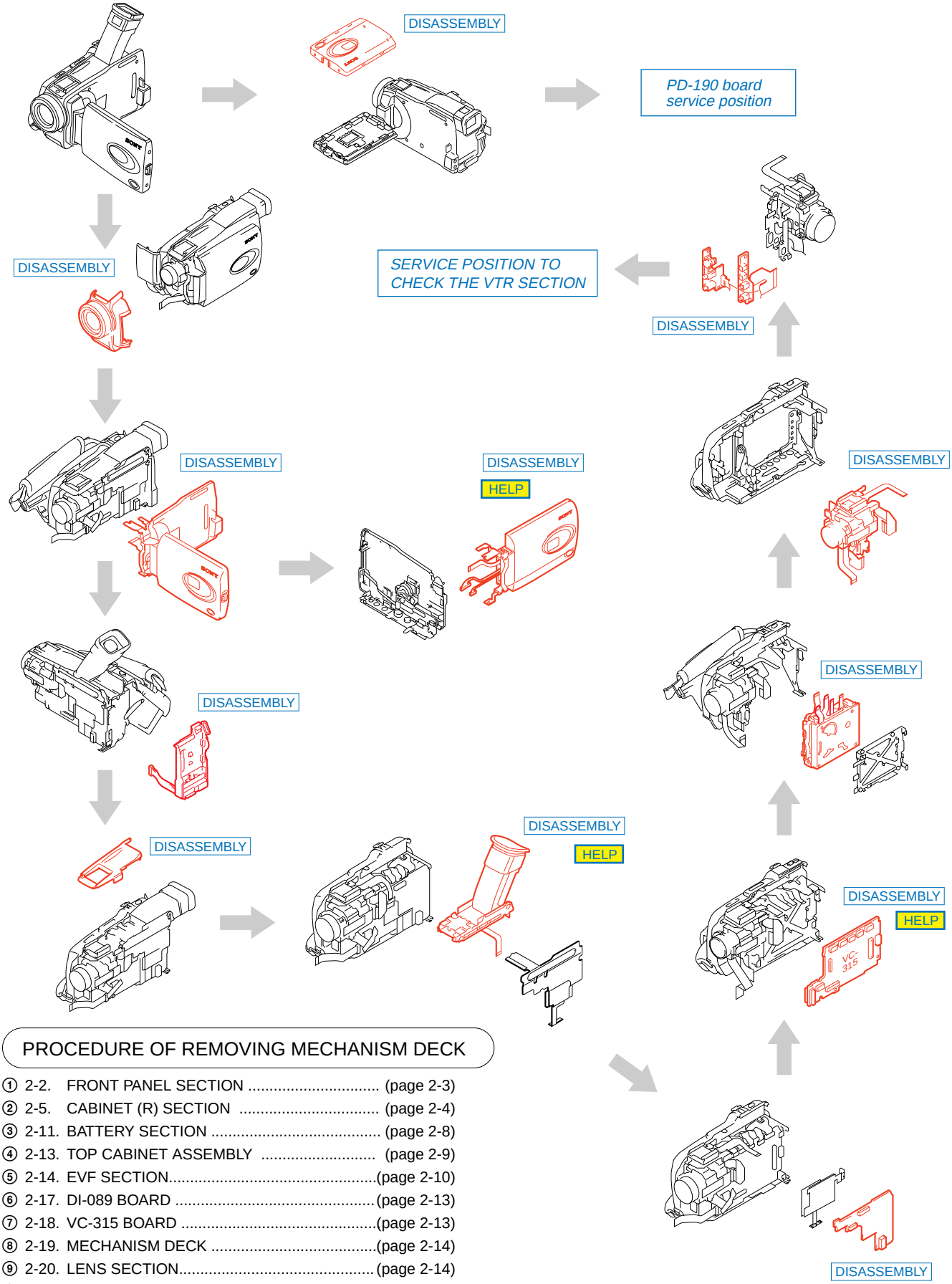
Self-diagnosis Code					Symptom/State	Correction
Repaired by:	Block Function		Detailed Code			
C	0	4	0	0	Non-standard battery is used.	Use the info LITHIUM battery.
C	2	1	0	0	Condensation.	Remove the cassette, and insert it again after one hour.
C	2	2	0	0	Video head is dirty.	Clean with the optional cleaning cassette.
C	3	1	1	0	LOAD direction. Loading does not complete within specified time	Load the tape again, and perform operations from the beginning.
C	3	1	1	1	UNLOAD direction. Loading does not complete within specified time	Load the tape again, and perform operations from the beginning.
C	3	1	2	0	T reel side tape slacking when unloading.	Load the tape again, and perform operations from the beginning.
C	3	1	2	1	Winding S reel fault when counting the rest of tape.	Load the tape again, and perform operations from the beginning.
C	3	1	2	2	T reel fault.	Load the tape again, and perform operations from the beginning.
C	3	1	2	3	S reel fault.	Load the tape again, and perform operations from the beginning.
C	3	1	2	4	T reel fault.	Load the tape again, and perform operations from the beginning.
C	3	1	3	0	FG fault when starting capstan.	Load the tape again, and perform operations from the beginning.
C	3	1	4	0	FG fault when starting drum.	Load the tape again, and perform operations from the beginning.
C	3	1	4	2	FG fault during normal drum operations.	Load the tape again, and perform operations from the beginning.
C	3	1	1	0	LOAD direction loading motor time-out.	Remove the battery or power cable, connect, and perform operations from the beginning.
C	3	1	1	1	UNLOAD direction loading motor time-out.	Remove the battery or power cable, connect, and perform operations from the beginning.
C	3	2	2	0	T reel side tape slacking when unloading.	Remove the battery or power cable, connect, and perform operations from the beginning.
C	3	2	2	1	Winding S reel fault when counting the rest of tape.	Remove the battery or power cable, connect, and perform operations from the beginning.
C	3	2	2	2	T reel fault.	Remove the battery or power cable, connect, and perform operations from the beginning.
C	3	2	2	3	S reel fault.	Remove the battery or power cable, connect, and perform operations from the beginning.
C	3	2	2	4	T reel fault.	Remove the battery or power cable, connect, and perform operations from the beginning.
C	3	2	3	0	FG fault when starting capstan.	Remove the battery or power cable, connect, and perform operations from the beginning.
C	3	2	4	0	FG fault when starting drum	Remove the battery or power cable, connect, and perform operations from the beginning.
C	3	2	4	2	FG fault during normal drum operations	Remove the battery or power cable, connect, and perform operations from the beginning.
E	6	1	0	0	Difficult to adjust focus (Cannot initialize focus.)	Inspect the lens block focus MR sensor (Pin ⑲, ⑳ of CN1301 of VC-315 board) when focusing is performed when the focus ring is rotated in the focus manual mode, and the focus motor drive circuit (IC1301 of VC-315 board) when the focusing is not performed.
E	6	1	1	0	Zoom operations fault (Cannot initialize zoom lens.)	Inspect the lens block zoom MR sensor (Pin ⑧, ⑩ of CN1301 of VC-315 board) when zooming is performed when the zoom lens is operated and the zoom motor drive circuit (IC1301 of VC-315 board) when zooming is not performed.
E	6	2	0	0	Steadyshot function does not work well. (With pitch angular velocity sensor output stopped.)	Inspect pitch angular velocity sensor (SE5001 of JK-248 board) peripheral circuits.
E	6	2	0	1	Steadyshot function does not work well. (With yaw angular velocity sensor output stopped.)	Inspect yaw angular velocity sensor (SE5002 of JK-248 board) peripheral circuits.

COVER

SECTION 2
DISASSEMBLY

HELP

The following flow chart shows the disassembly procedure.

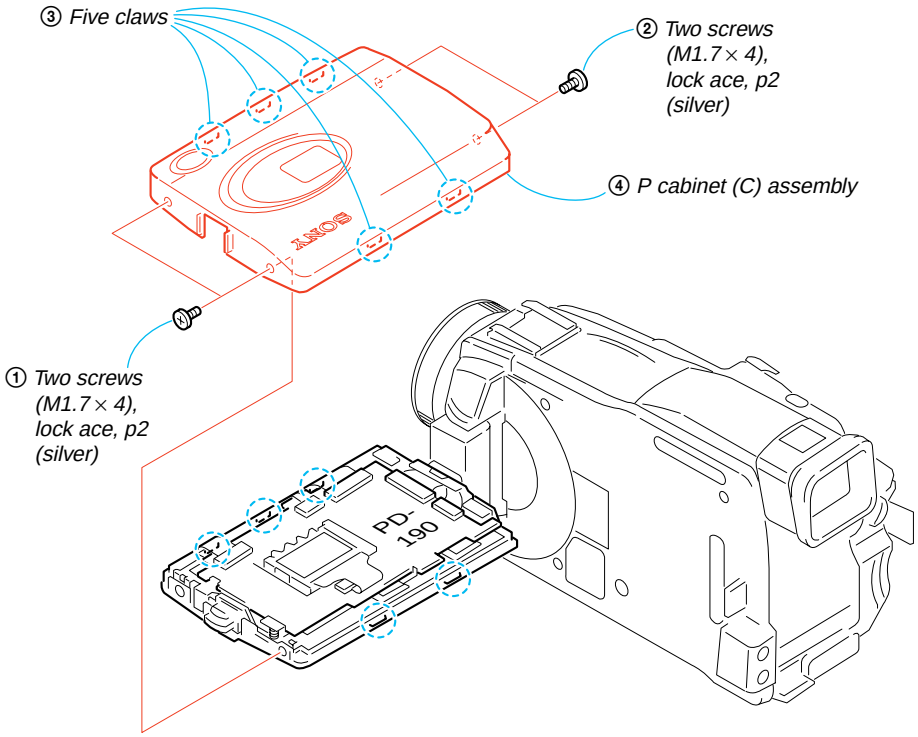


PROCEDURE OF REMOVING MECHANISM DECK

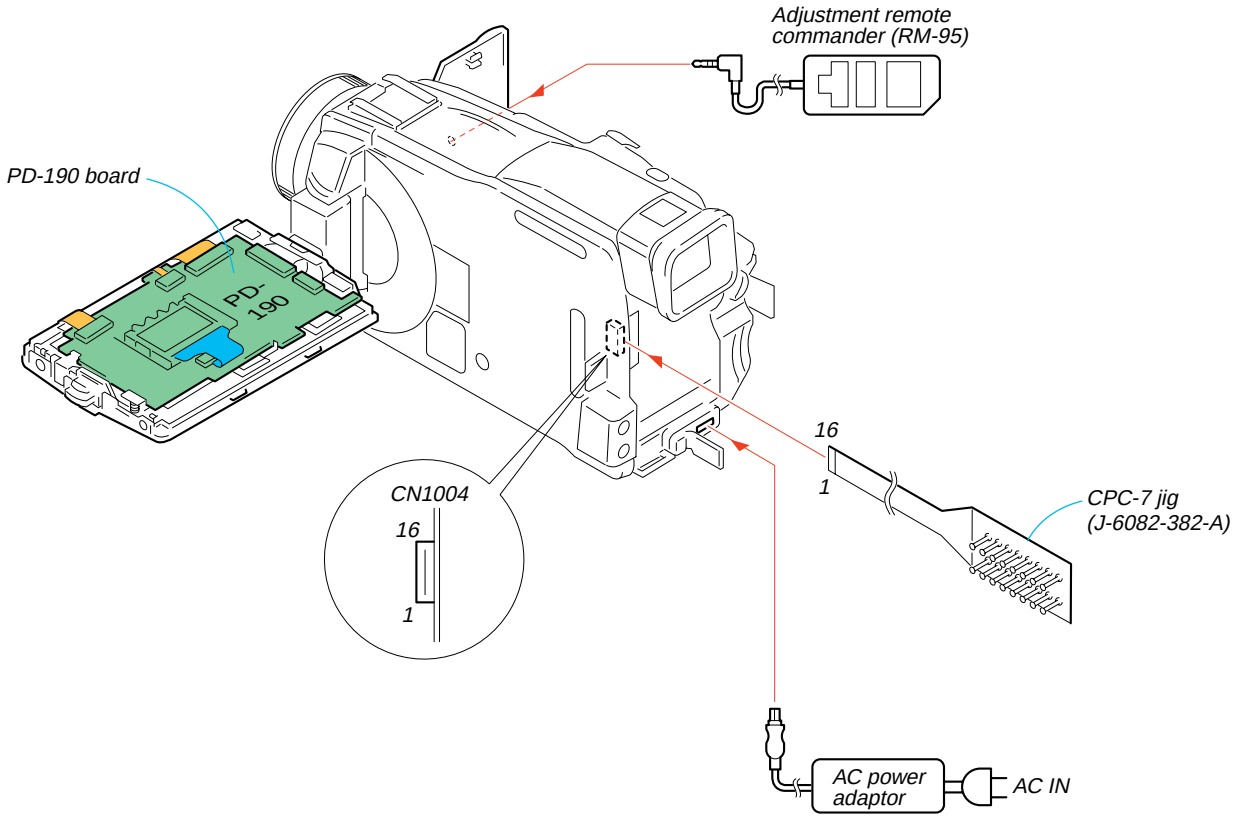
① 2-2. FRONT PANEL SECTION ..... (page 2-3)
② 2-5. CABINET (R) SECTION ..... (page 2-4)
③ 2-11. BATTERY SECTION ..... (page 2-8)
④ 2-13. TOP CABINET ASSEMBLY ..... (page 2-9)
⑤ 2-14. EVF SECTION.....(page 2-10)
⑥ 2-17. DI-089 BOARD .....(page 2-13)
⑦ 2-18. VC-315 BOARD .....(page 2-13)
⑧ 2-19. MECHANISM DECK .....(page 2-14)
⑨ 2-20. LENS SECTION.....(page 2-14)
⑩ 2-21. JK-248, JK-249 BOARD .....(page 2-15)
⑪ SERVICE POSITION TO CHECK THE VTR SECTION..... (page 2-16)

NOTE: Follow the disassembly procedure in the numerical order given.

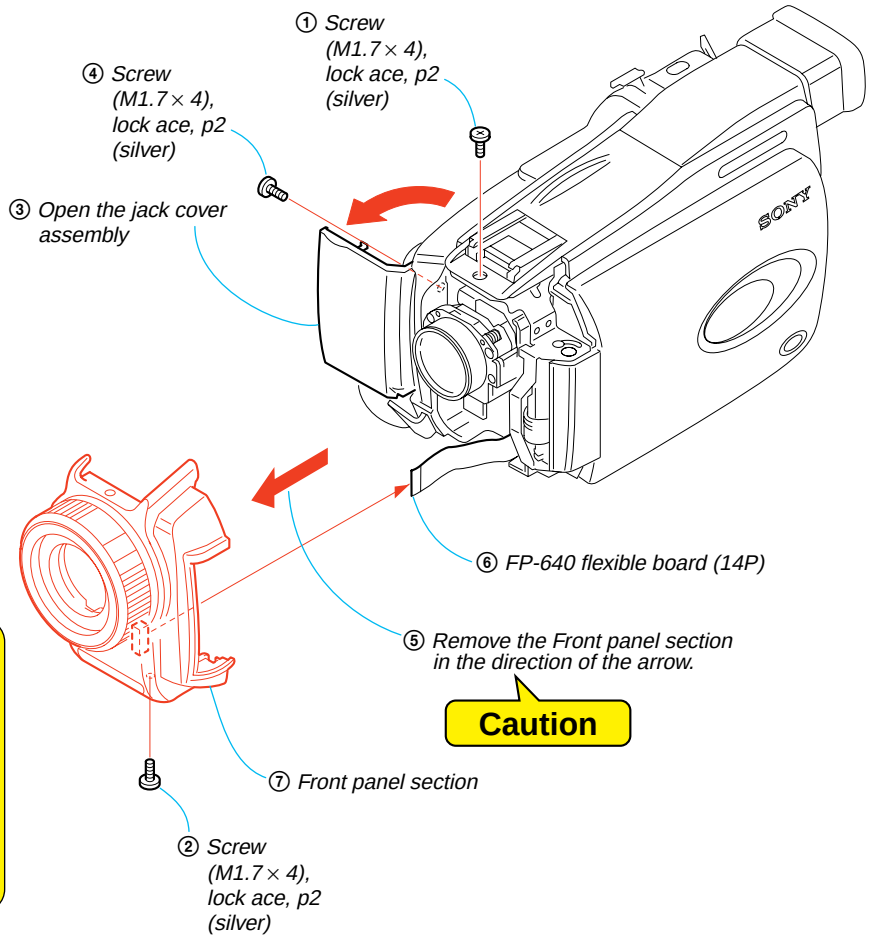
2-1. P CABINET (C) ASSEMBLY



[PD-190 BOARD SERVICE POSITION]



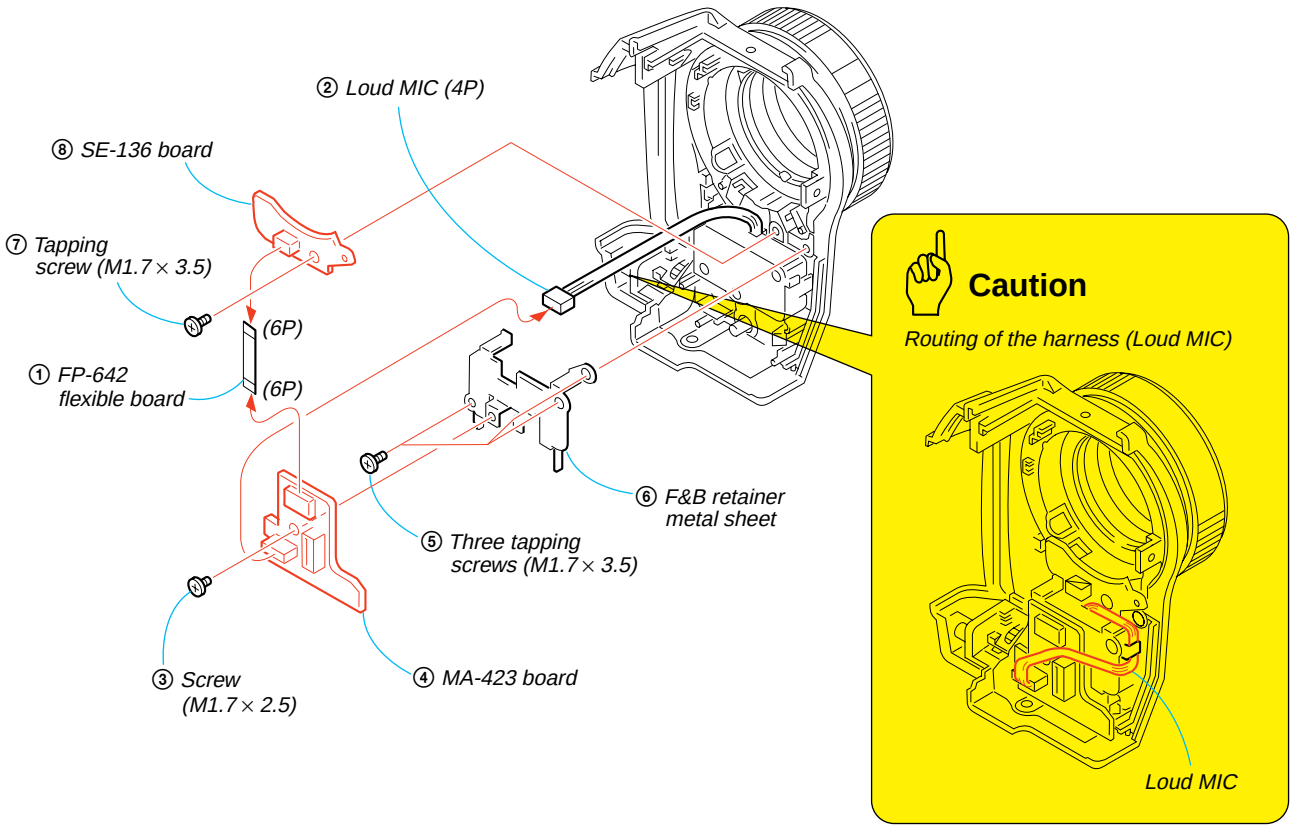
2-2. FRONT PANEL SECTION


① Screw (M1.7× 4), lock ace, p2 (silver)
④ Screw (M1.7× 4), lock ace, p2 (silver)
③ Open the jack cover assembly
⑥ FP-640 flexible board (14P)
⑤ Remove the Front panel section in the direction of the arrow.
Caution
⑦ Front panel section
② Screw (M1.7× 4), lock ace, p2 (silver)

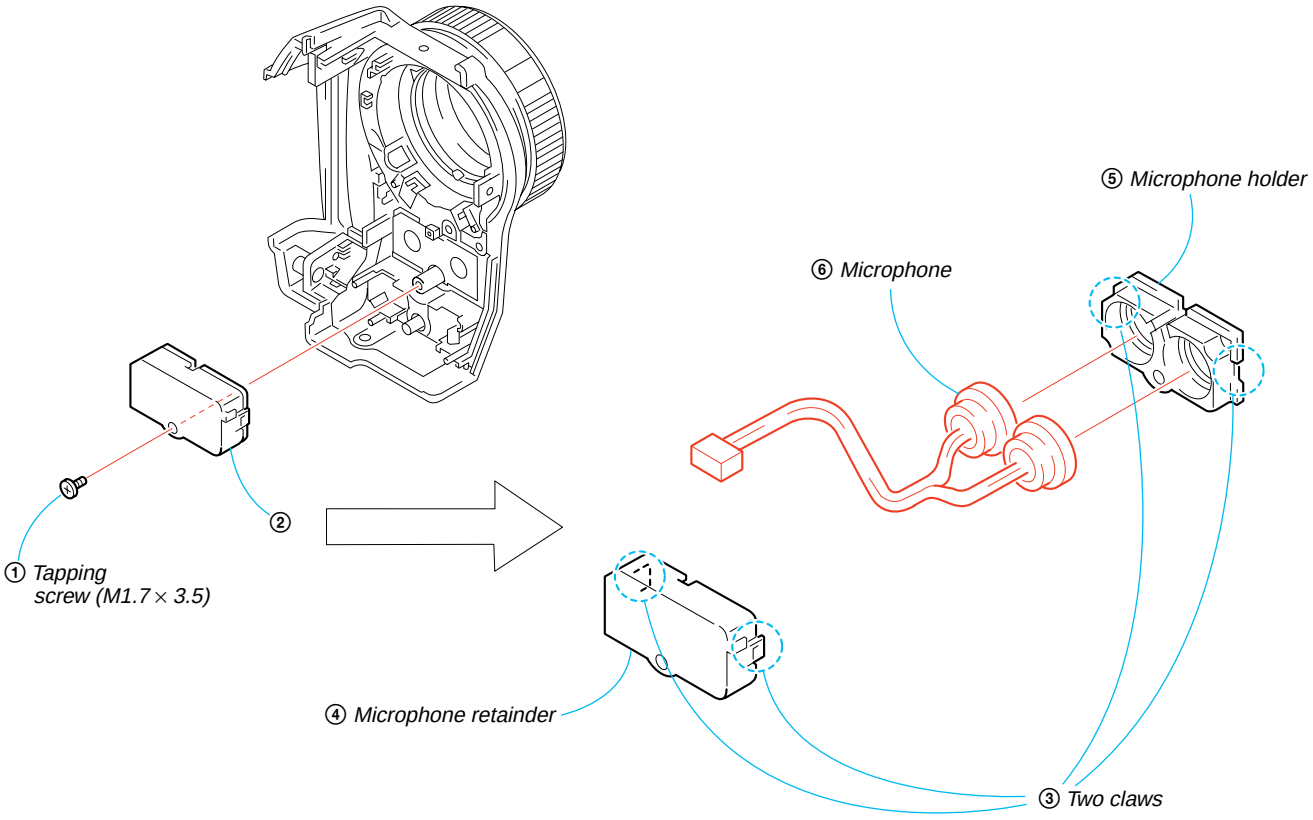
Caution

Because the ⑦ Front panel section is connected to the main unit by the ⑥ FP-640 flexible board, the flexible board may be damaged if you remove the Front panel section forcibly. Be very careful not to damage the flexible board.

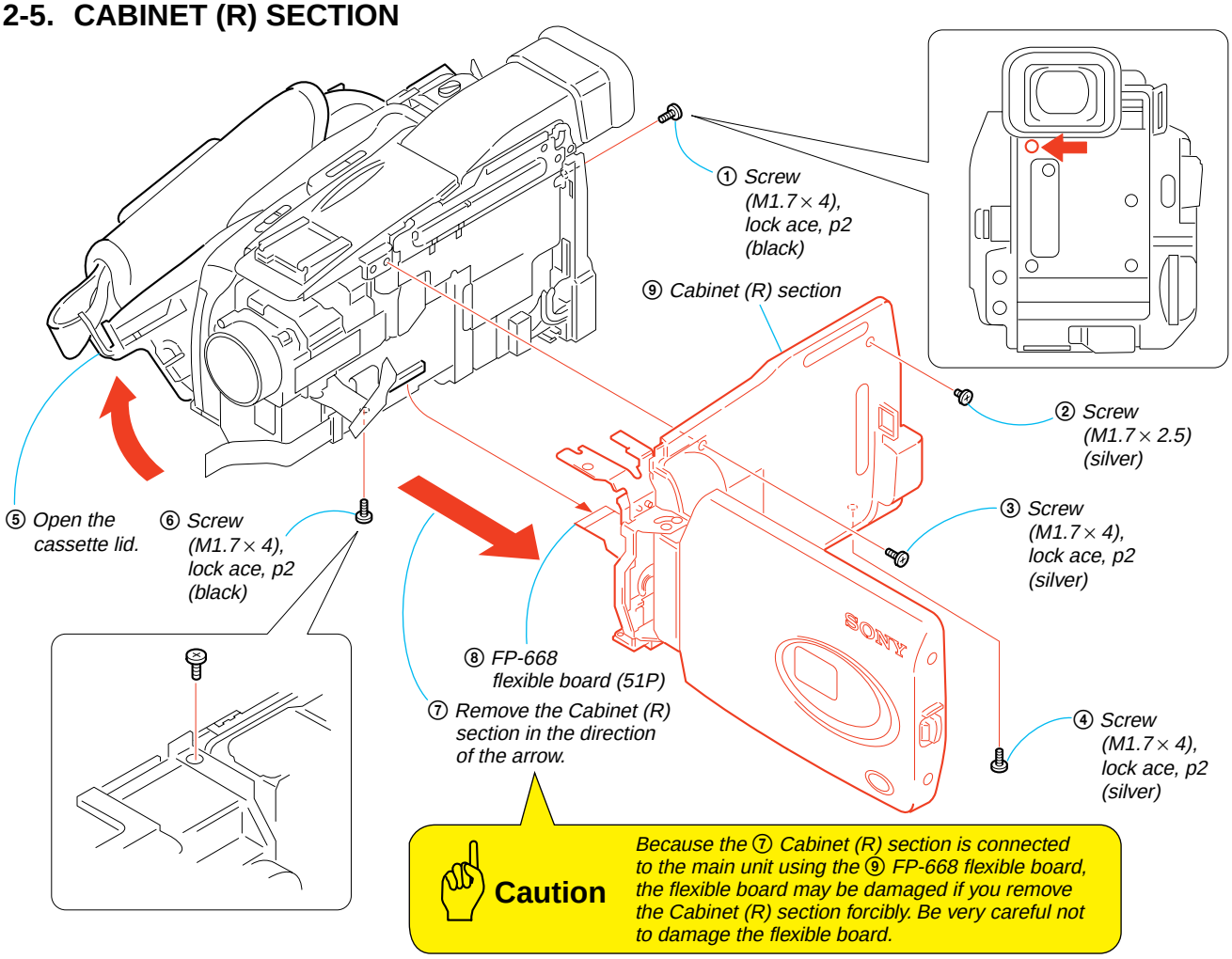
2-3. MA-423, SE-136 BOARD



2-4. MICROPHONE



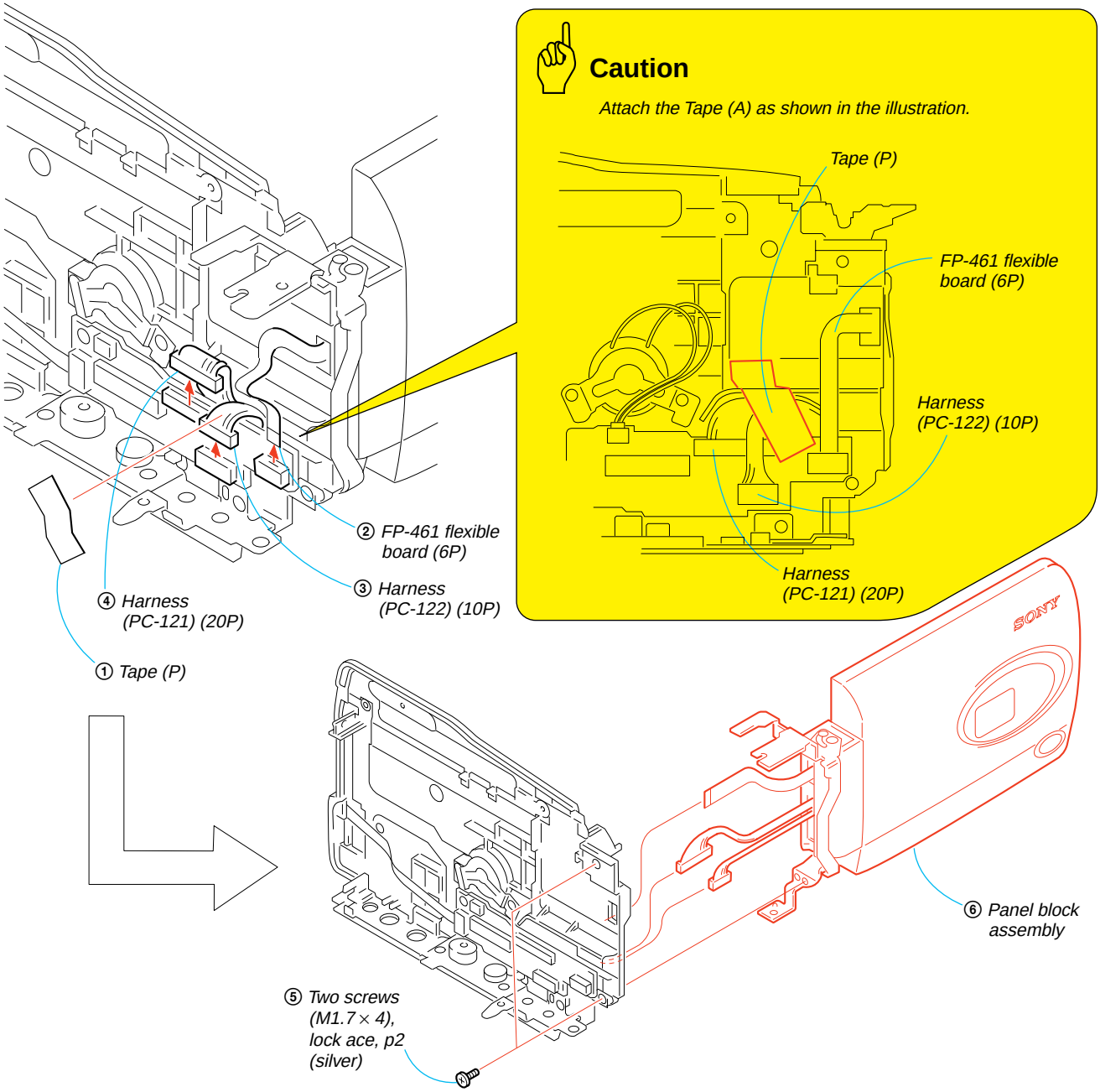
2-5. CABINET (R) SECTION


① Screw (M1.7 × 4), lock ace, p2 (black)
⑨ Cabinet (R) section
② Screw (M1.7 × 2.5) (silver)
⑤ Open the cassette lid.
⑥ Screw (M1.7 × 4), lock ace, p2 (black)
③ Screw (M1.7 × 4), lock ace, p2 (silver)
⑧ FP-668 flexible board (51P)
⑦ Remove the Cabinet (R) section in the direction of the arrow.
④ Screw (M1.7 × 4), lock ace, p2 (silver)
SONY

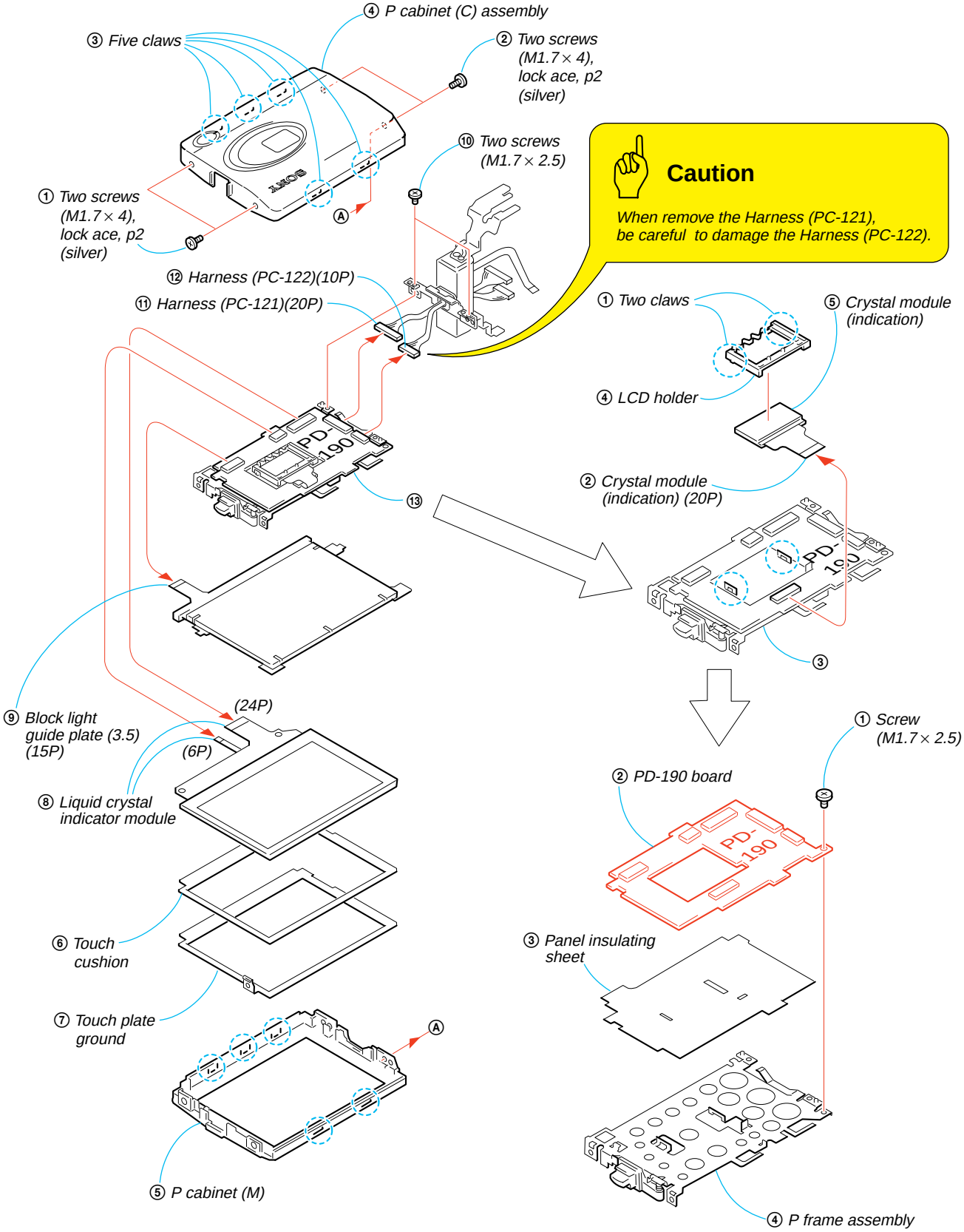
Caution

Because the ⑦ Cabinet (R) section is connected to the main unit using the ⑨ FP-668 flexible board, the flexible board may be damaged if you remove the Cabinet (R) section forcibly. Be very careful not to damage the flexible board.

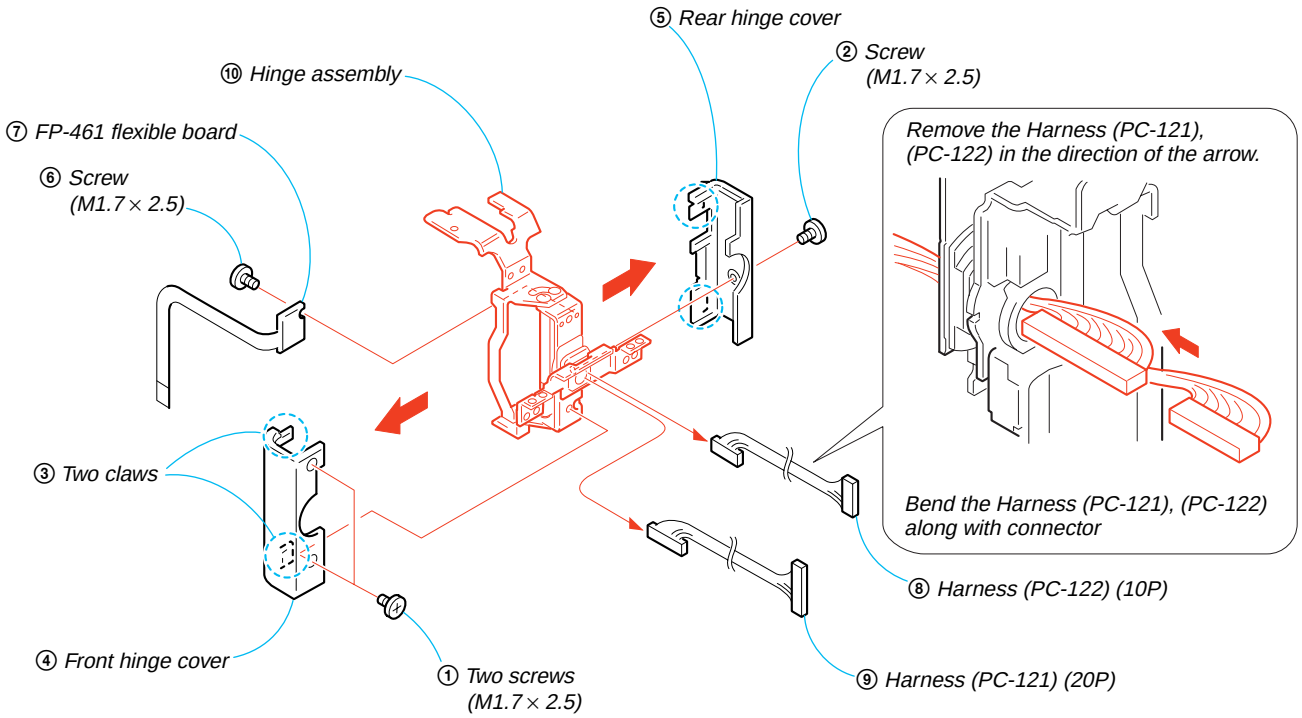
2-6. PANEL BLOCK ASSEMBLY


Caution
Attach the Tape (A) as shown in the illustration.
Tape (P)
FP-461 flexible board (6P)
Harness (PC-122) (10P)
Harness (PC-121) (20P)
② FP-461 flexible board (6P)
③ Harness (PC-122) (10P)
④ Harness (PC-121) (20P)
① Tape (P)
SONY
⑥ Panel block assembly
⑤ Two screws (M1.7 × 4), lock ace, p2 (silver)

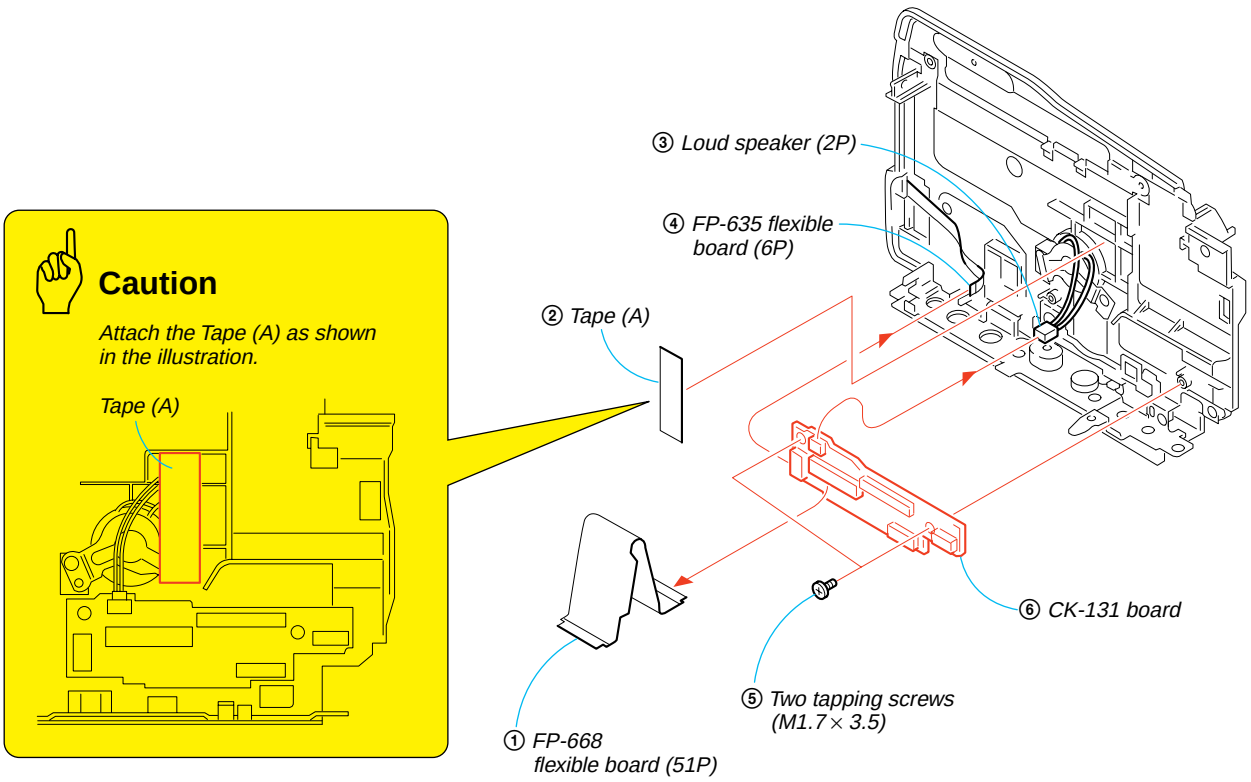
2-7. PD-190 BOARD


④ P cabinet (C) assembly
③ Five claws
② Two screws (M1.7× 4), lock ace, p2 (silver)
⑩ Two screws (M1.7× 2.5)
① Two screws (M1.7× 4), lock ace, p2 (silver)
Caution
When remove the Harness (PC-121), be careful to damage the Harness (PC-122).
⑫ Harness (PC-122)(10P)
⑪ Harness (PC-121)(20P)
① Two claws
⑤ Crystal module (indication)
④ LCD holder
② Crystal module (indication) (20P)
⑬
③
⑨ Block light guide plate (3.5) (15P)
(24P)
(6P)
⑧ Liquid crystal indicator module
⑥ Touch cushion
⑦ Touch plate ground
⑤ P cabinet (M)
① Screw (M1.7× 2.5)
② PD-190 board
③ Panel insulating sheet
④ P frame assembly

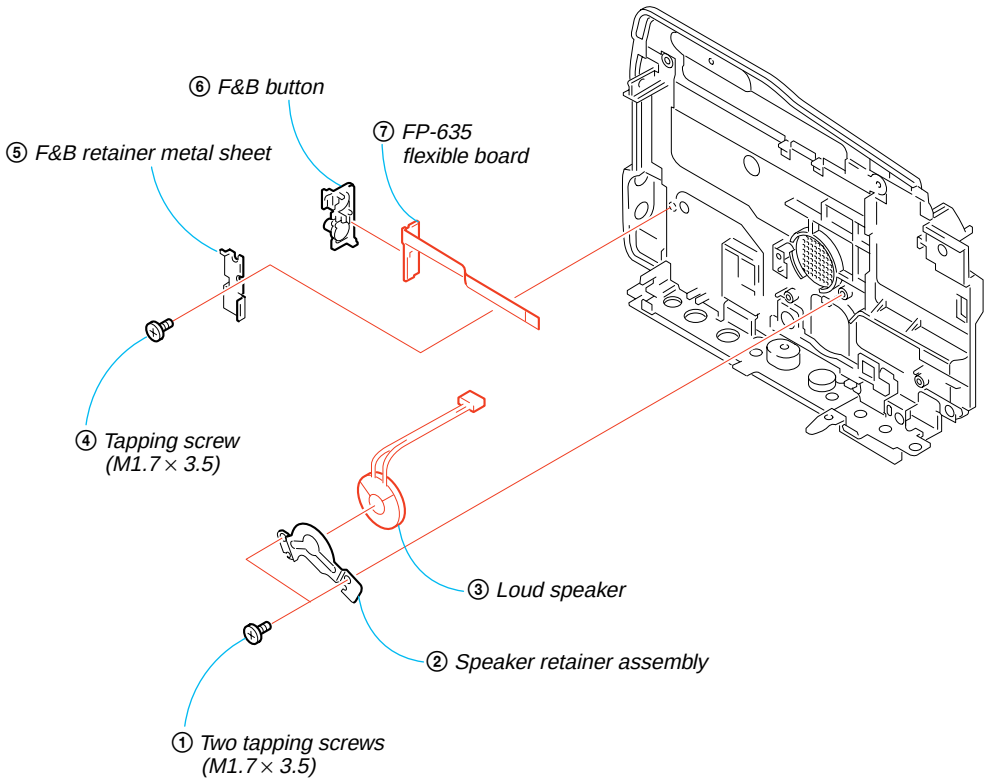
2-8. HINGE ASSEMBLY


⑤ Rear hinge cover
② Screw (M1.7 × 2.5)
⑩ Hinge assembly
⑦ FP-461 flexible board
⑥ Screw (M1.7 × 2.5)
Remove the Harness (PC-121), (PC-122) in the direction of the arrow.
③ Two claws
Bend the Harness (PC-121), (PC-122) along with connector
⑧ Harness (PC-122) (10P)
④ Front hinge cover
① Two screws (M1.7 × 2.5)
⑨ Harness (PC-121) (20P)

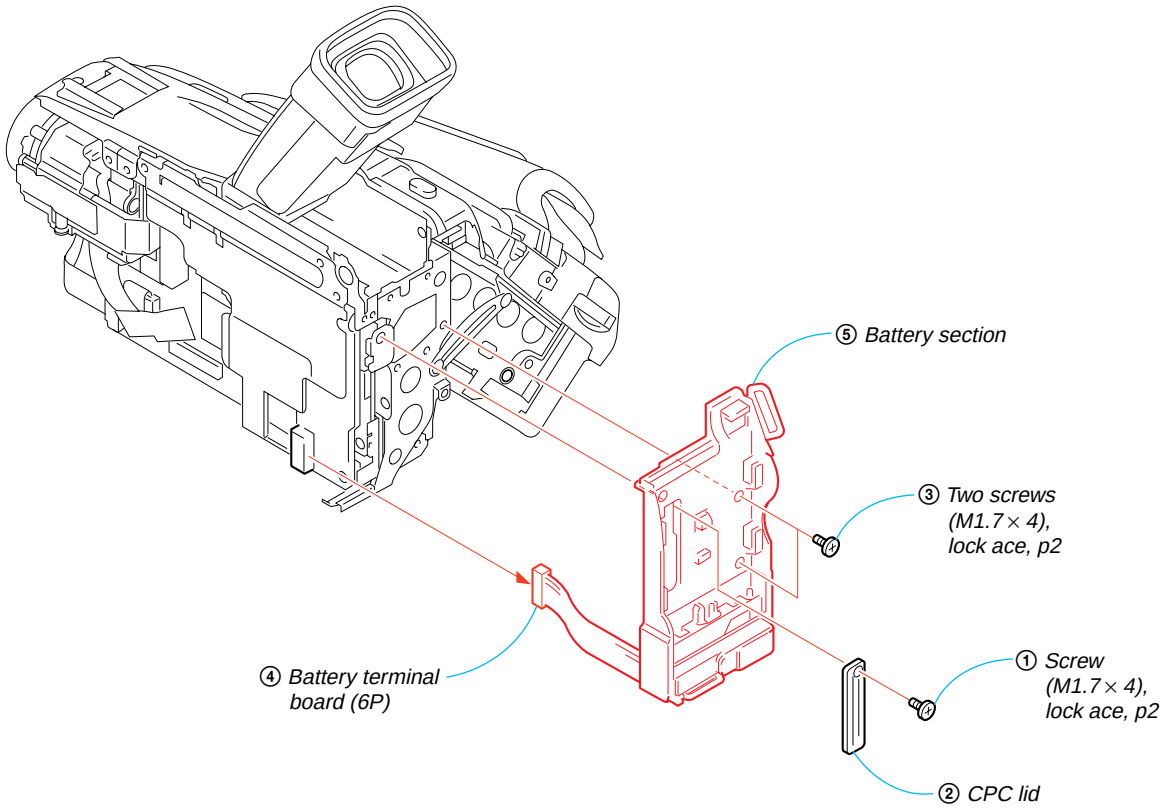
2-9. CK-131 BOARD


Caution
Attach the Tape (A) as shown in the illustration.
Tape (A)
③ Loud speaker (2P)
④ FP-635 flexible board (6P)
② Tape (A)
⑥ CK-131 board
⑤ Two tapping screws (M1.7 × 3.5)
① FP-668 flexible board (51P)

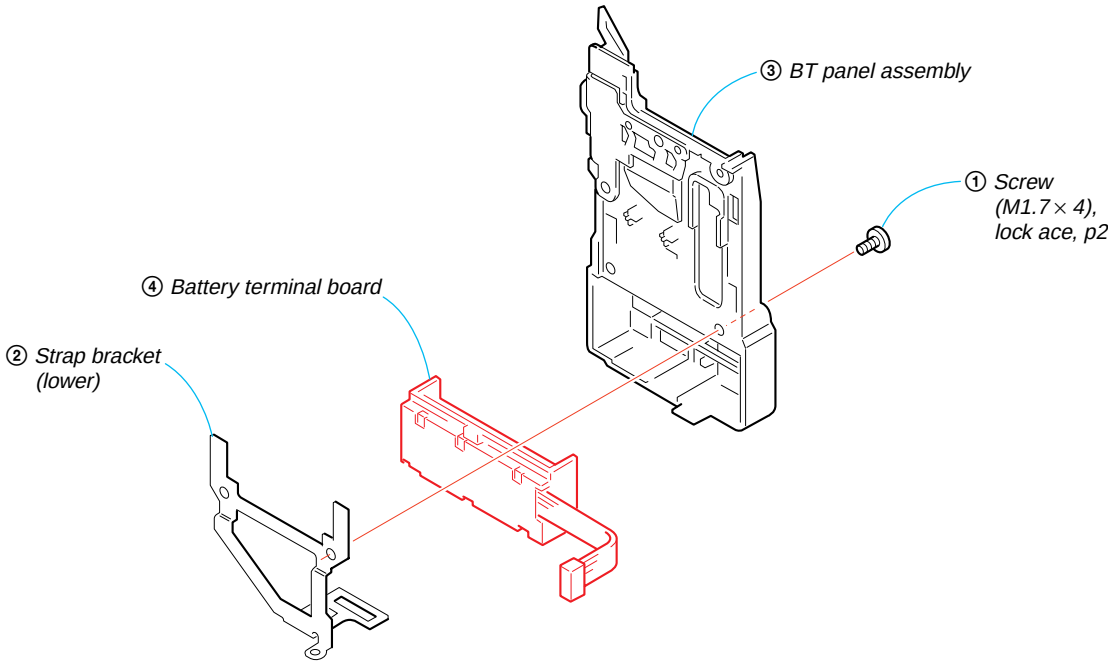
2-10. LOUD SPEAKER, FP-635 FLEXIBLE BOARD


⑥ F&B button
⑦ FP-635 flexible board
⑤ F&B retainer metal sheet
④ Tapping screw (M1.7 × 3.5)
③ Loud speaker
② Speaker retainer assembly
① Two tapping screws (M1.7 × 3.5)

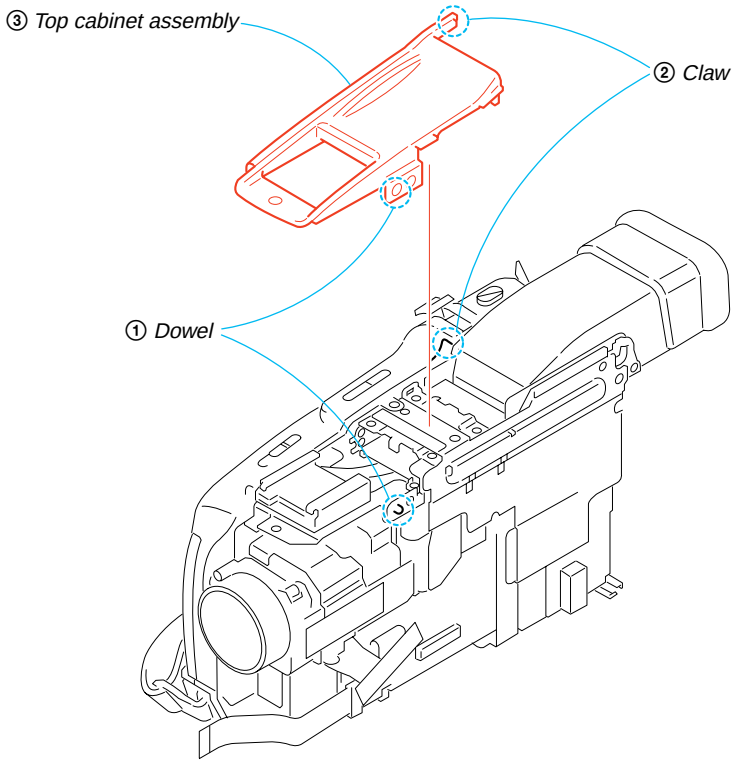
2-11. BATTERY SECTION



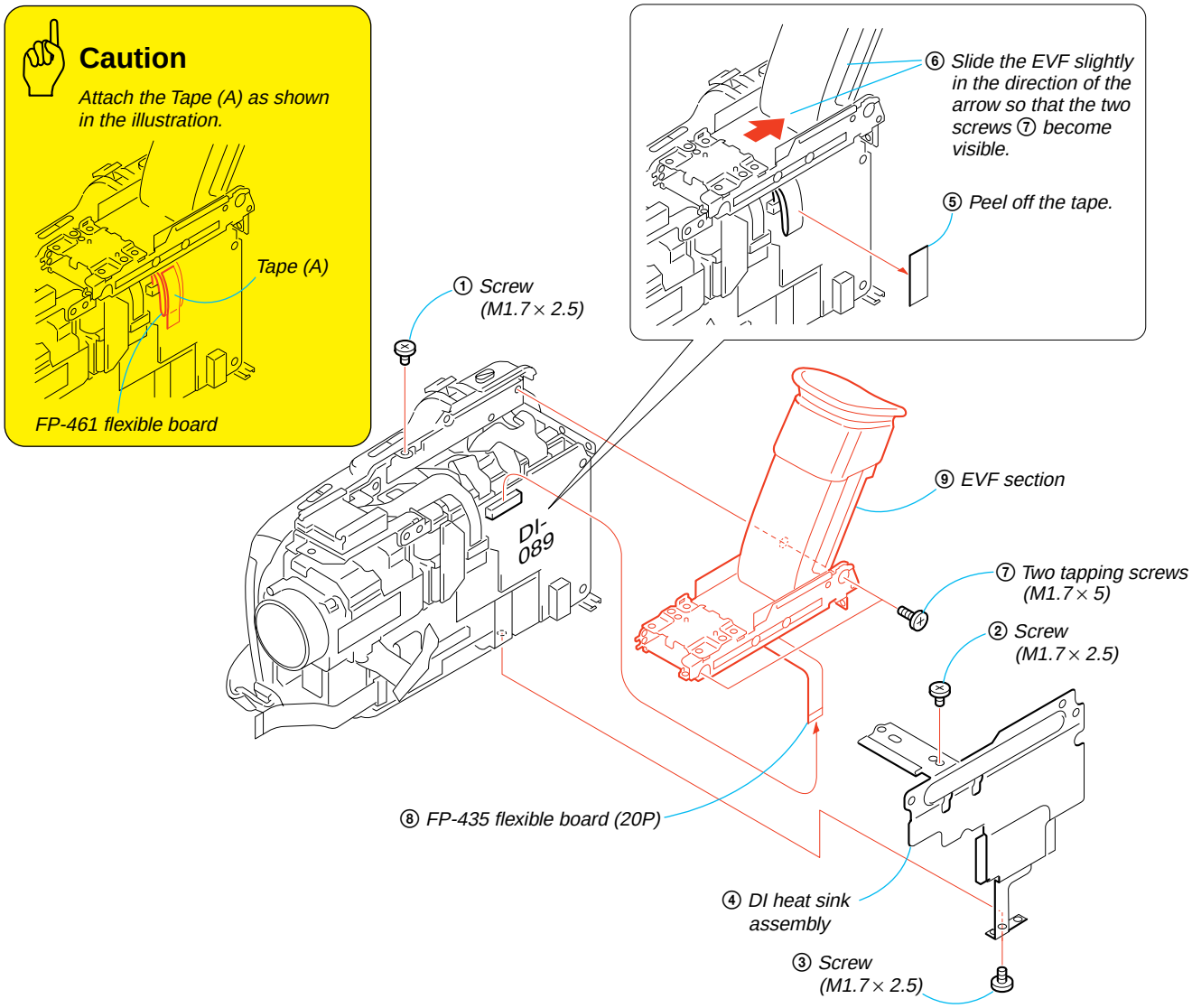
2-12. BATTERY TERMINAL BOARD



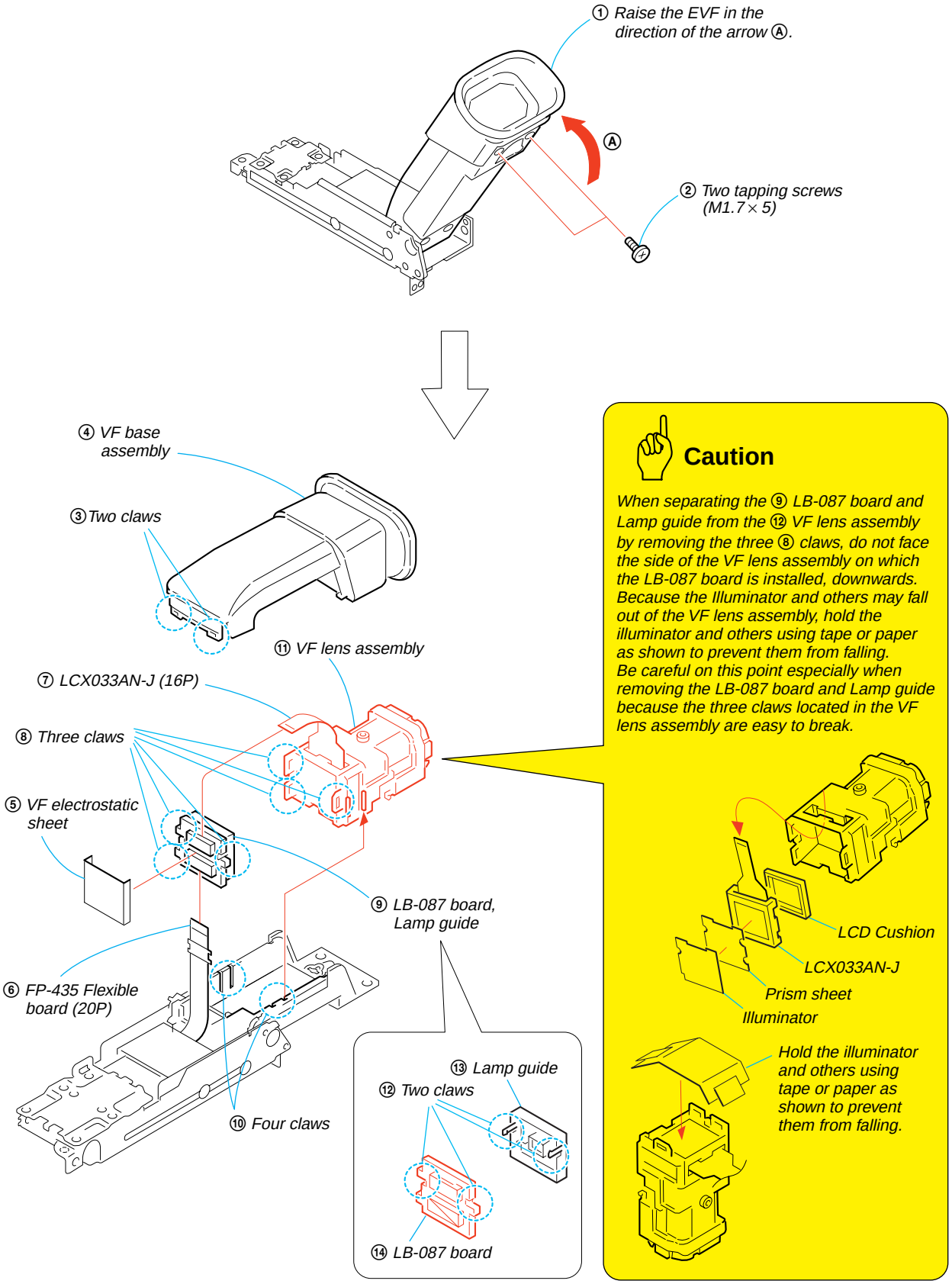
2-13. TOP CABINET ASSEMBLY



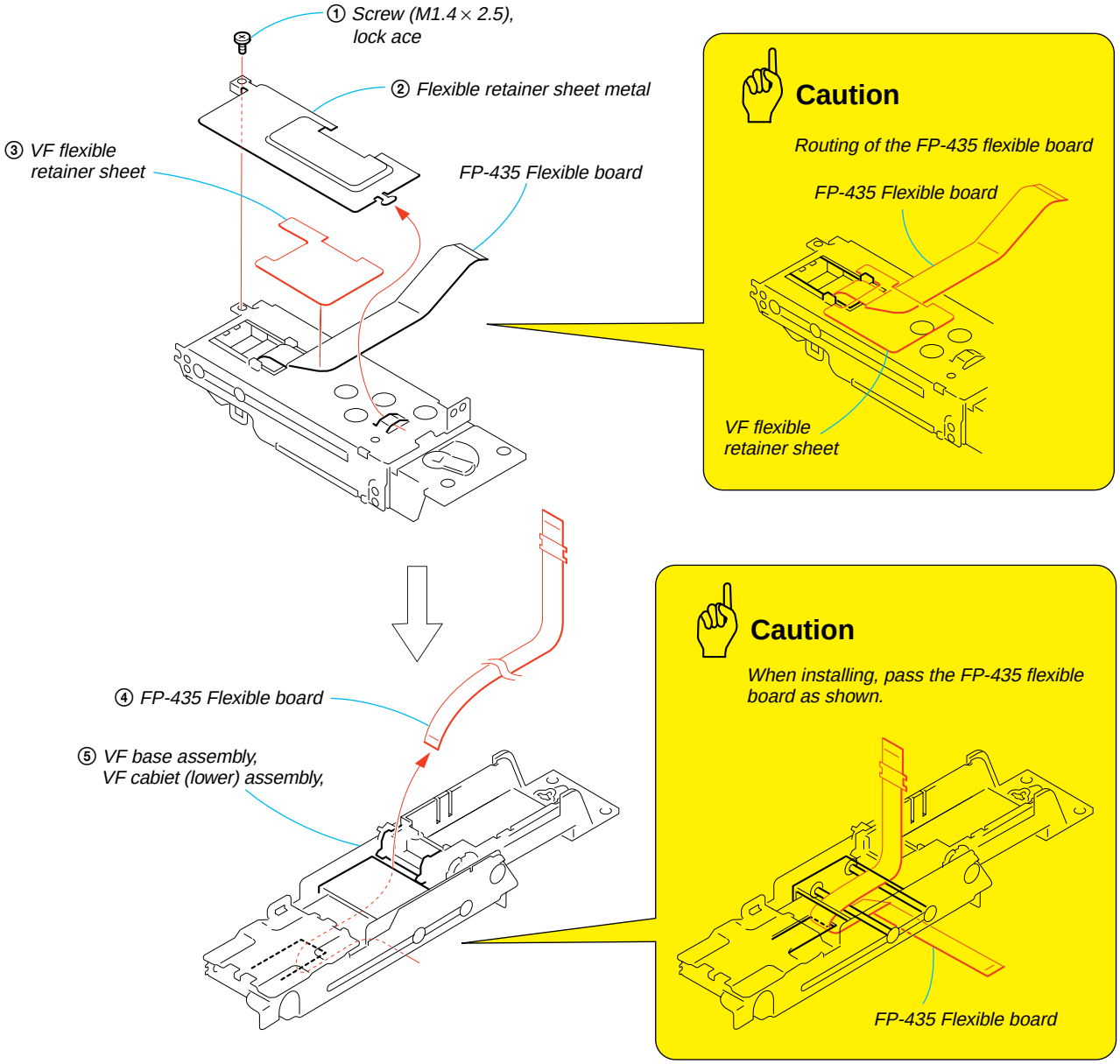
2-14. EVF SECTION


Caution
Attach the Tape (A) as shown in the illustration.
Tape (A)
FP-461 flexible board
⑥ Slide the EVF slightly in the direction of the arrow so that the two screws ⑦ become visible.
⑤ Peel off the tape.
① Screw (M1.7 × 2.5)
DI-089
⑨ EVF section
⑦ Two tapping screws (M1.7 × 5)
② Screw (M1.7 × 2.5)
⑧ FP-435 flexible board (20P)
④ DI heat sink assembly
③ Screw (M1.7 × 2.5)

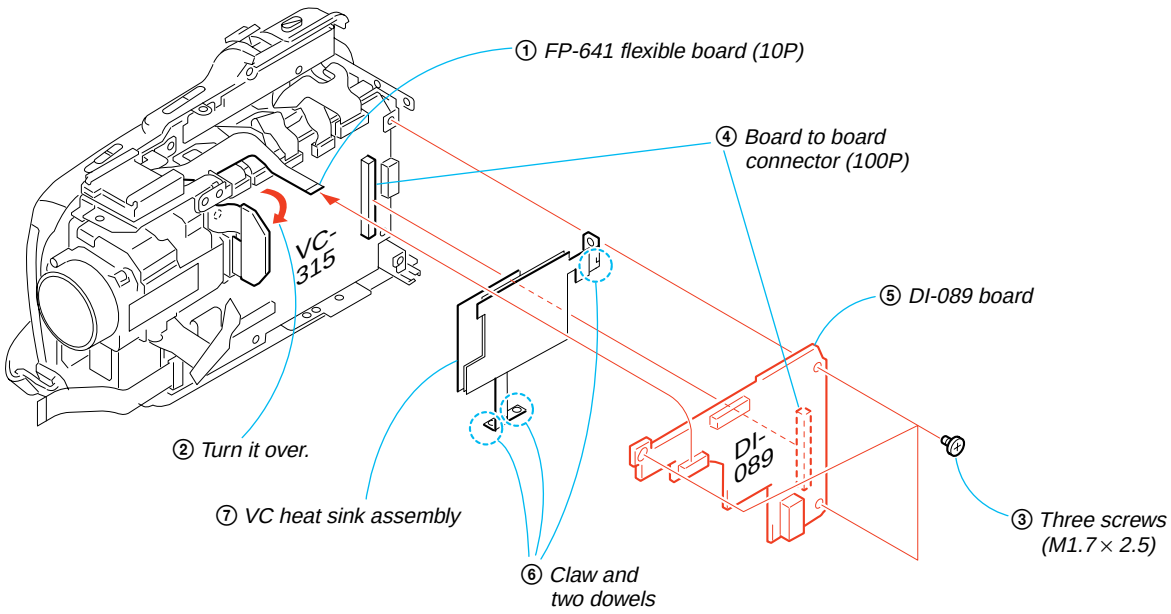
2-15. VF LENS ASSEMBLY


① Raise the EVF in the direction of the arrow Ⓐ.
Ⓐ
② Two tapping screws (M1.7 × 5)
④ VF base assembly
③ Two claws
⑪ VF lens assembly
⑦ LCX033AN-J (16P)
⑧ Three claws
⑤ VF electrostatic sheet
⑨ LB-087 board, Lamp guide
⑥ FP-435 Flexible board (20P)
⑩ Four claws
⑬ Lamp guide
⑫ Two claws
⑭ LB-087 board
Caution
When separating the ⑨ LB-087 board and Lamp guide from the ⑫ VF lens assembly by removing the three ⑧ claws, do not face the side of the VF lens assembly on which the LB-087 board is installed, downwards. Because the Illuminator and others may fall out of the VF lens assembly, hold the illuminator and others using tape or paper as shown to prevent them from falling.
Be careful on this point especially when removing the LB-087 board and Lamp guide because the three claws located in the VF lens assembly are easy to break.
LCD Cushion
LCX033AN-J
Prism sheet
Illuminator
Hold the illuminator and others using tape or paper as shown to prevent them from falling.

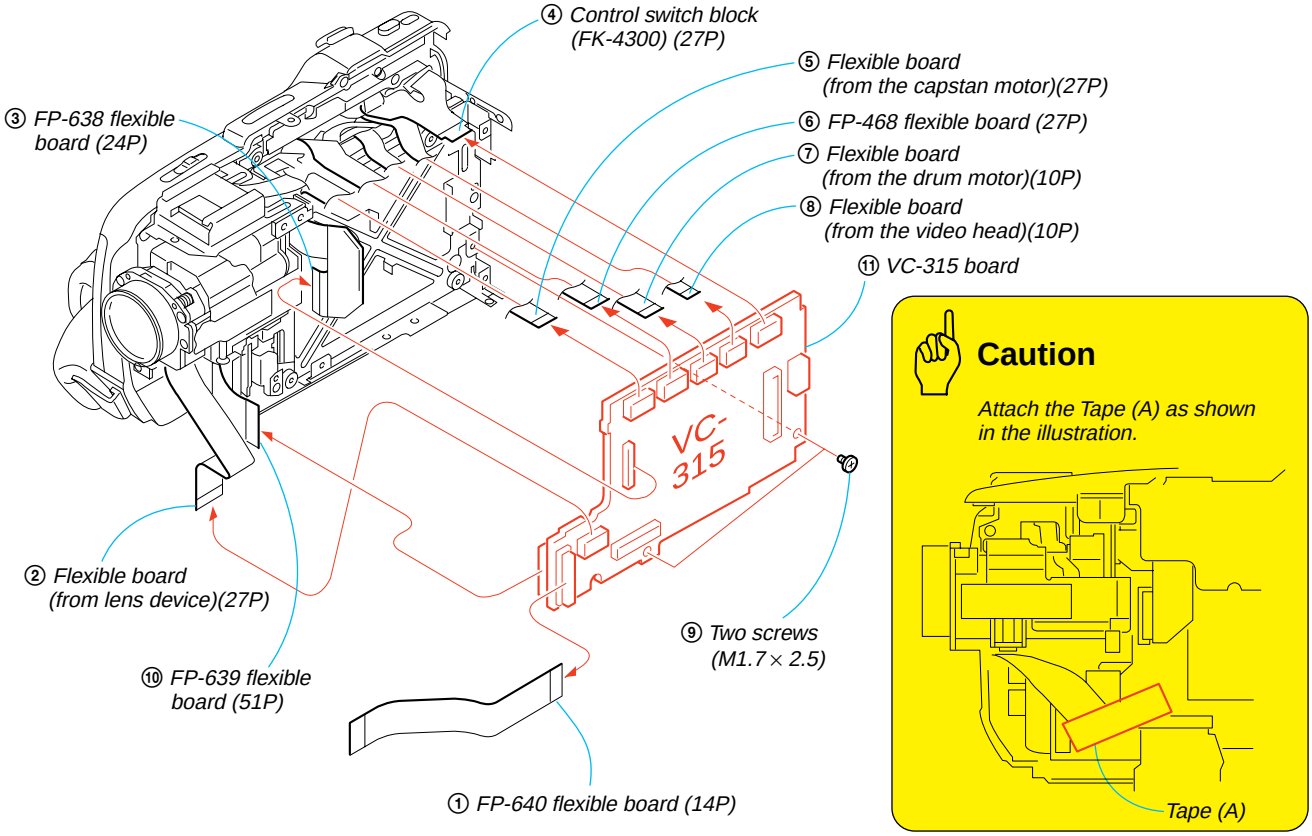
2-16. FP-435 FLEXIBLE BOARD


① Screw (M1.4 × 2.5), lock ace
② Flexible retainer sheet metal
③ VF flexible retainer sheet
FP-435 Flexible board
Caution
Routing of the FP-435 flexible board
FP-435 Flexible board
VF flexible retainer sheet
④ FP-435 Flexible board
⑤ VF base assembly, VF cabiet (lower) assembly,
Caution
When installing, pass the FP-435 flexible board as shown.
FP-435 Flexible board

2-17. DI-089 BOARD


① FP-641 flexible board (10P)
④ Board to board connector (100P)
⑤ DI-089 board
② Turn it over.
⑦ VC heat sink assembly
③ Three screws (M1.7 × 2.5)
⑥ Claw and two dowels
VC-315
DI-089

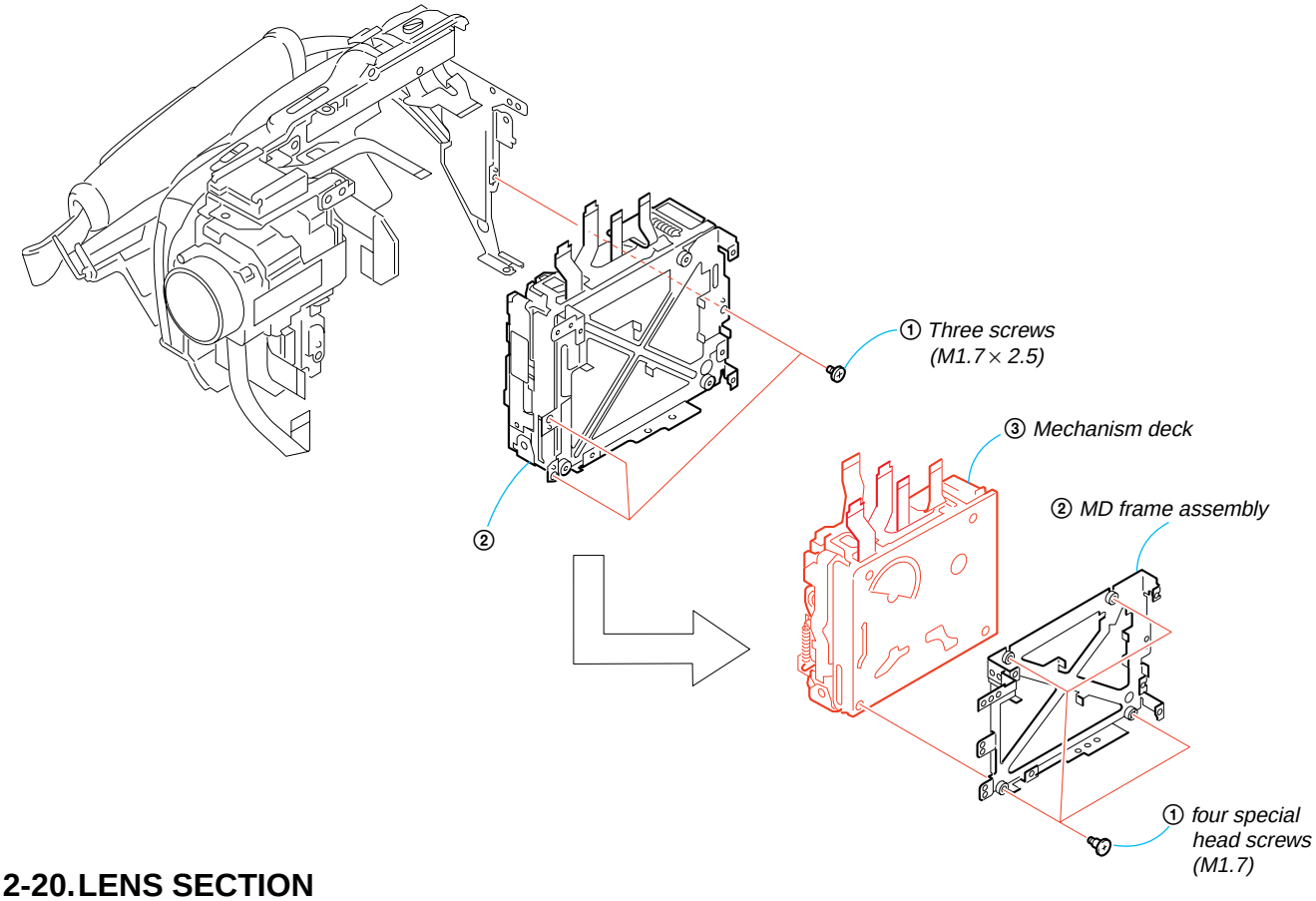
2-18. VC-315 BOARD


④ Control switch block (FK-4300) (27P)
⑤ Flexible board (from the capstan motor)(27P)
③ FP-638 flexible board (24P)
⑥ FP-468 flexible board (27P)
⑦ Flexible board (from the drum motor)(10P)
⑧ Flexible board (from the video head)(10P)
⑪ VC-315 board
② Flexible board (from lens device)(27P)
⑨ Two screws (M1.7 × 2.5)
⑩ FP-639 flexible board (51P)
① FP-640 flexible board (14P)
VC-315

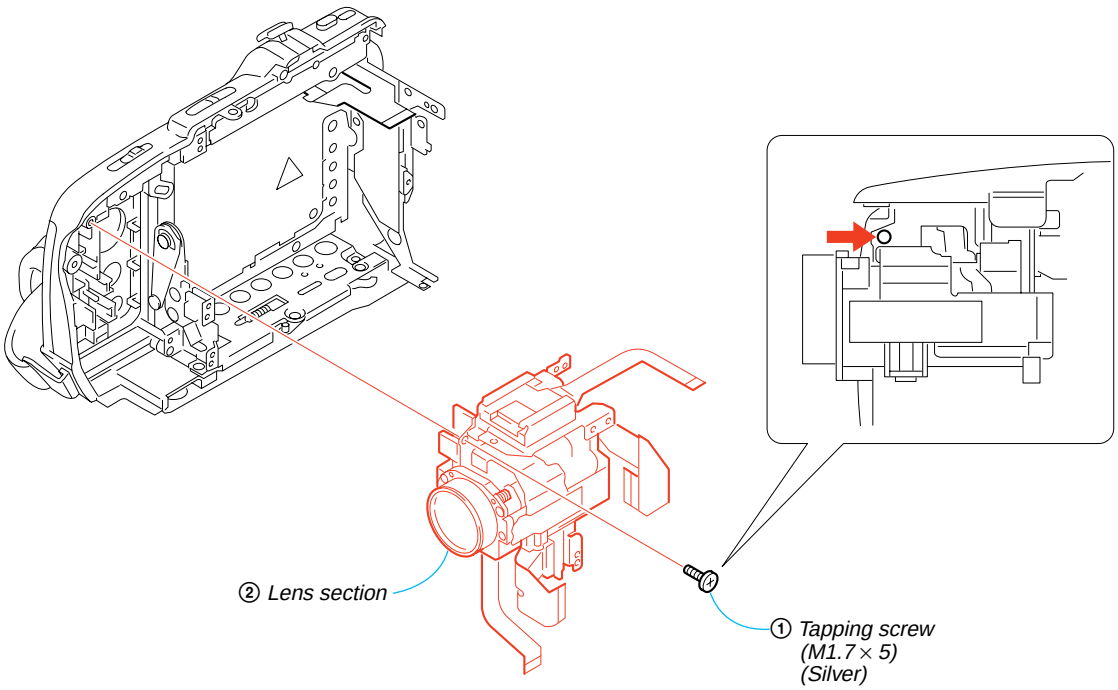
Caution

Attach the Tape (A) as shown in the illustration.

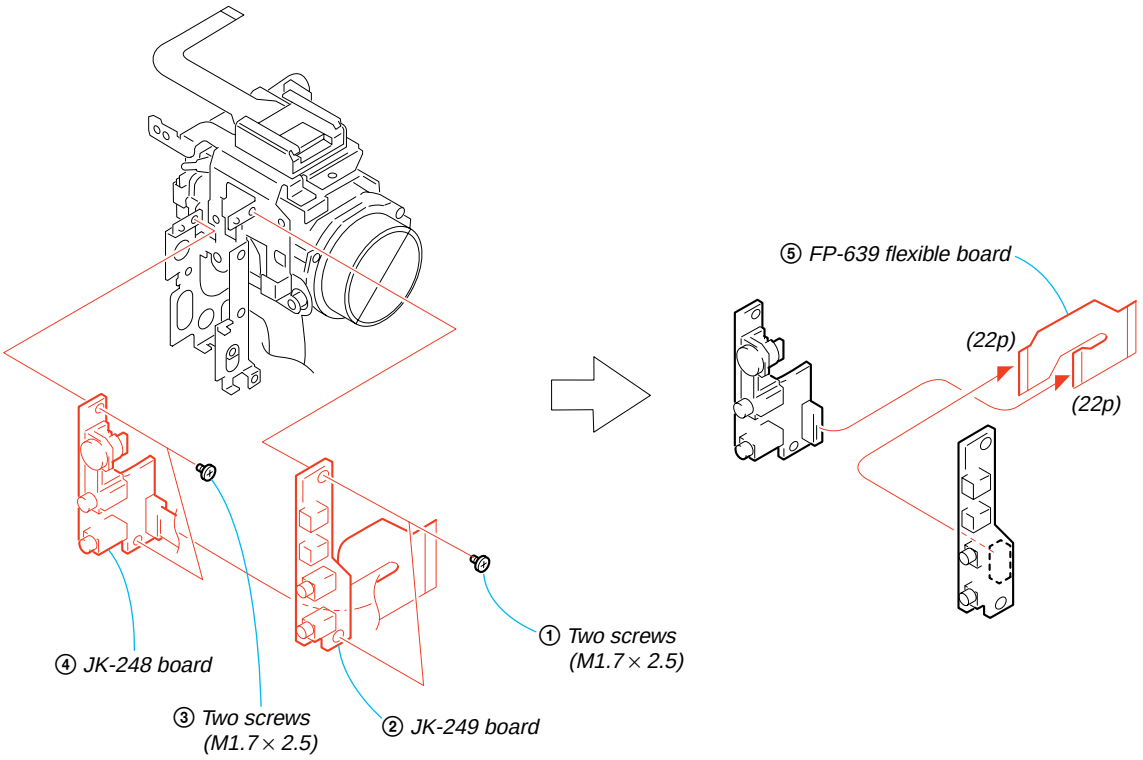
2-19. MECHANISM DECK



2-20. LENS SECTION



2-21. JK-248, JK-249 BOARD



[SERVICE POSITION TO CHECK THE VTR SECTION]

Connection to Check the VTR Section

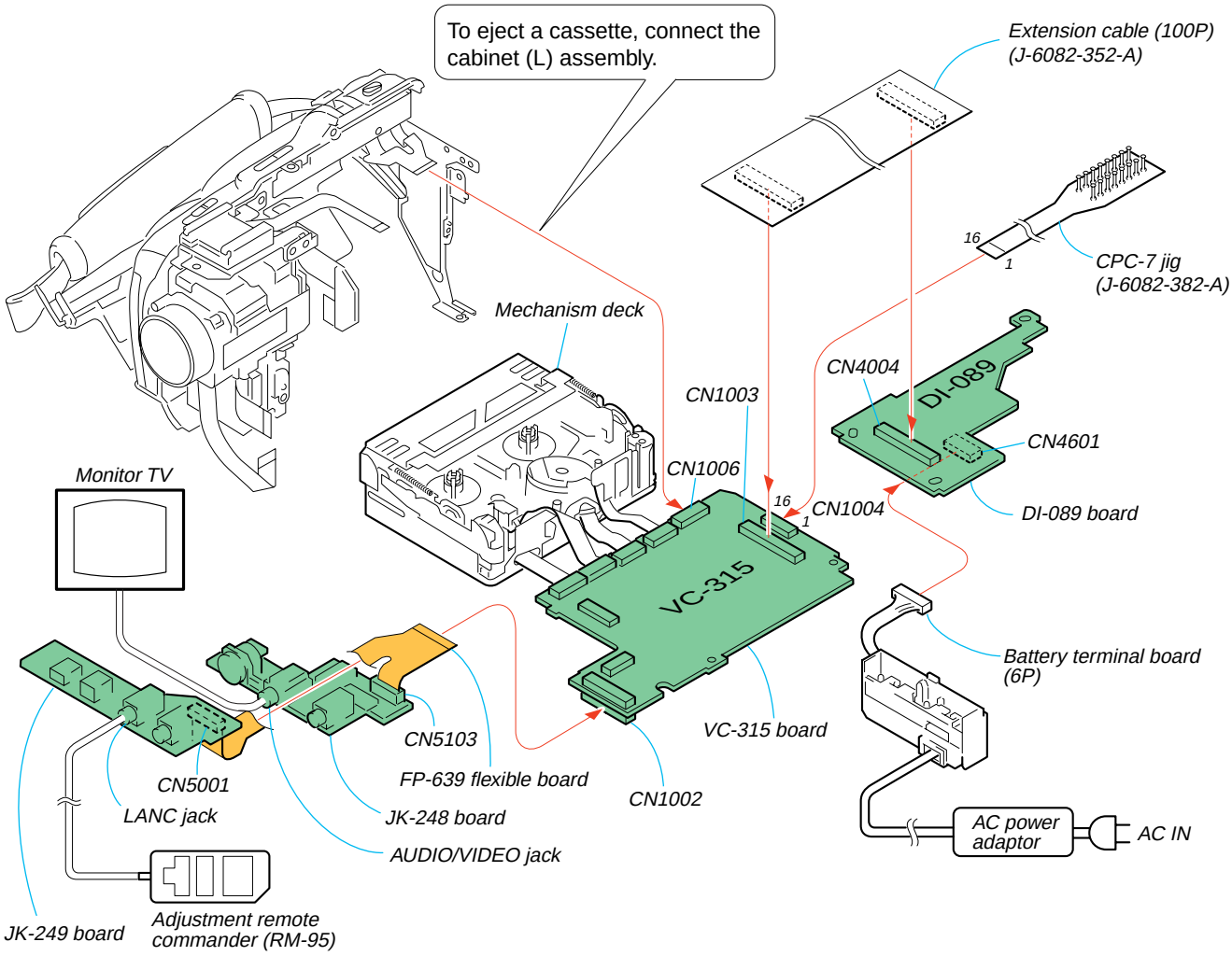
To check the VTR section, set the VTR to the "Forced VTR power ON" mode.
Operate the VTR functions using the adjustment remote commander (with the HOLD switch set in the OFF position).

Setting the "Forced VTR Power ON" mode

1) Select page: 0, address: 01, and set data: 01.
2) Select page: 0, address: 10, and set data: 00.
3) Select page: D, address: 10, set data: 02, and press the PAUSE button of the adjustment remote commander.

Exiting the "Forced VTR Power ON" mode

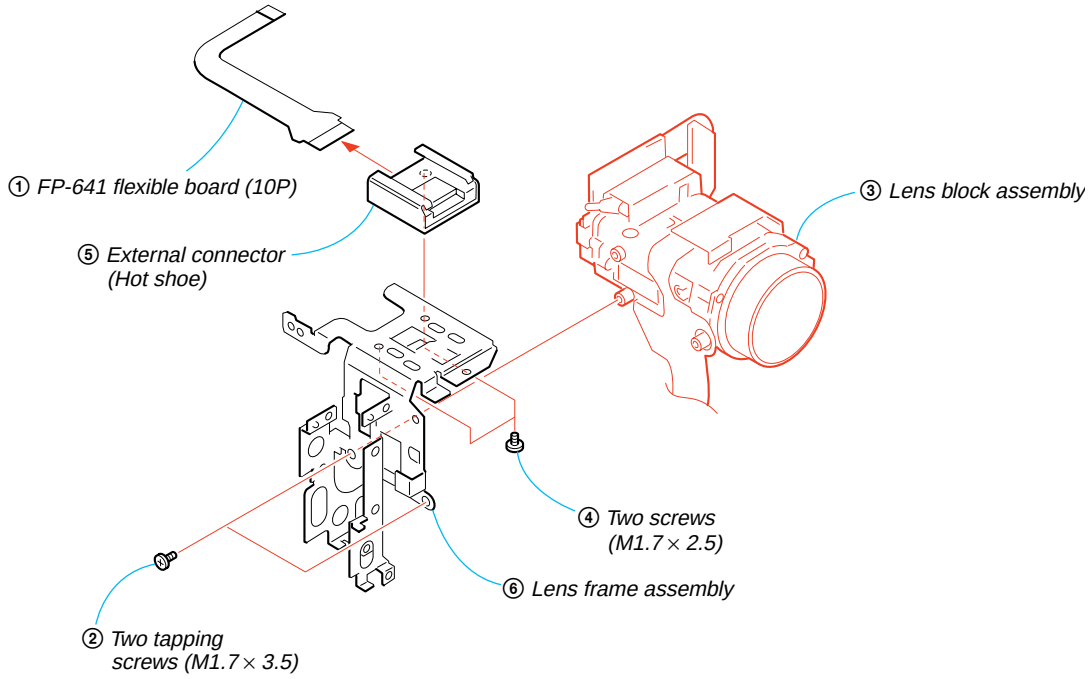
1) Select page: 0, address: 01, and set data: 01.
2) Select page: 0, address: 10, and set data: 00.
3) Select page: D, address: 10, set data: 00, and press the PAUSE button of the adjustment remote commander.
4) Select page: 0, address: 01, and set data: 00.



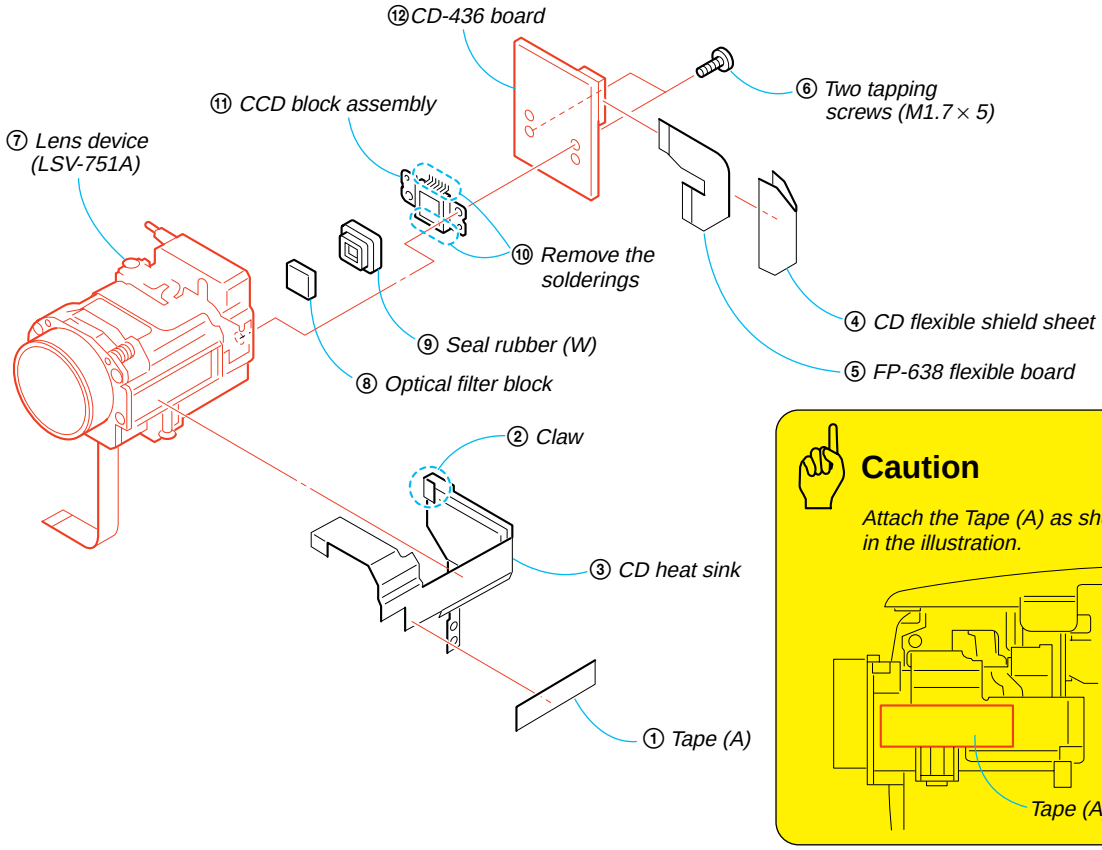
PROCEDURE OF REMOVING MECHANISM DECK

① 2-2. FRONT PANEL SECTION ..... (page 2-3)
② 2-5. CABINET (R) SECTION ..... (page 2-4)
③ 2-11. BATTERY SECTION ..... (page 2-8)
④ 2-13. TOP CABINET ASSEMBLY ..... (page 2-9)
⑤ 2-14. EVF SECTION.....(page 2-10)
⑥ 2-17. DI-089 BOARD .....(page 2-13)
⑦ 2-18. VC-315 BOARD .....(page 2-13)
⑧ 2-19. MECHANISM DECK .....(page 2-14)
⑨ 2-20. LENS SECTION.....(page 2-14)
⑩ 2-21. JK-248, JK-249 BOARD .....(page 2-15)

2-22. LENS BLOCK ASSEMBLY

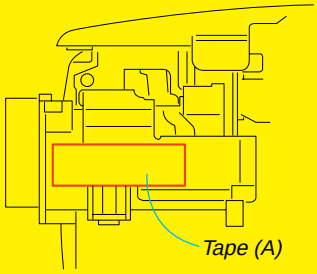

① FP-641 flexible board (10P)
⑤ External connector (Hot shoe)
③ Lens block assembly
④ Two screws (M1.7 × 2.5)
⑥ Lens frame assembly
② Two tapping screws (M1.7 × 3.5)

2-23. LENS DEVICE (LSV-751A), CD-436 BOARD

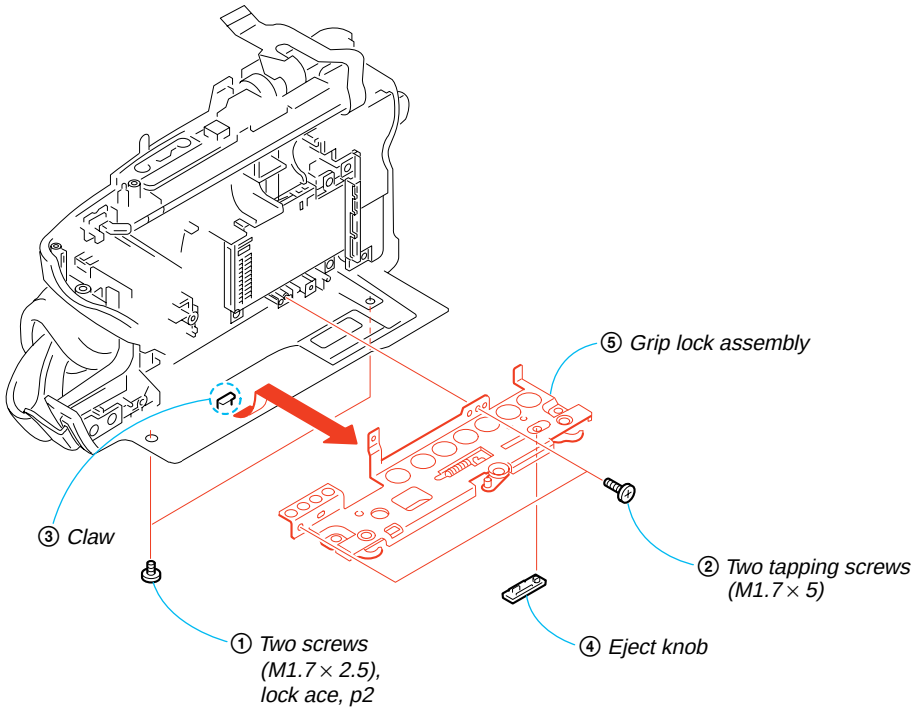

⑫ CD-436 board
⑥ Two tapping screws (M1.7 × 5)
⑪ CCD block assembly
⑦ Lens device (LSV-751A)
⑩ Remove the solderings
④ CD flexible shield sheet
⑨ Seal rubber (W)
⑤ FP-638 flexible board
⑧ Optical filter block
② Claw
③ CD heat sink
① Tape (A)

Caution

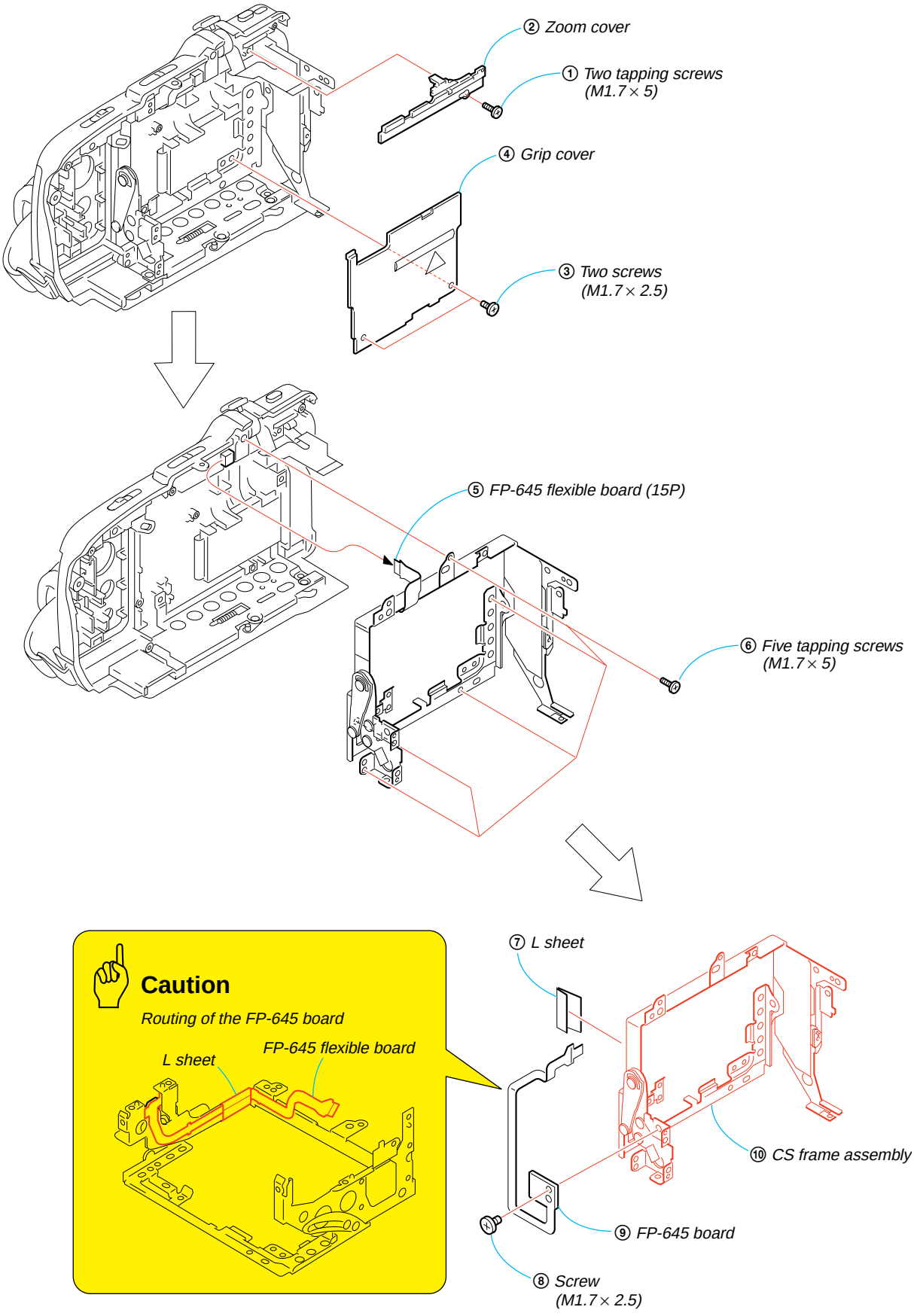
Attach the Tape (A) as shown in the illustration.



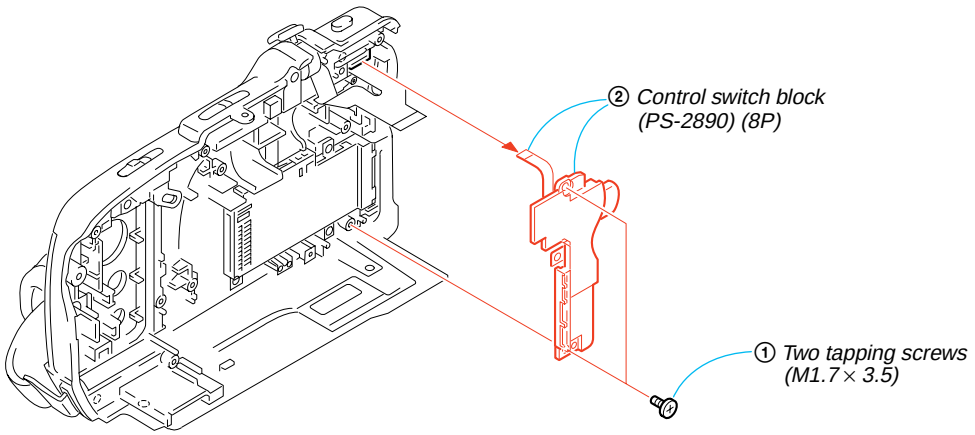
2-24. GRIP LOCK ASSEMBLY



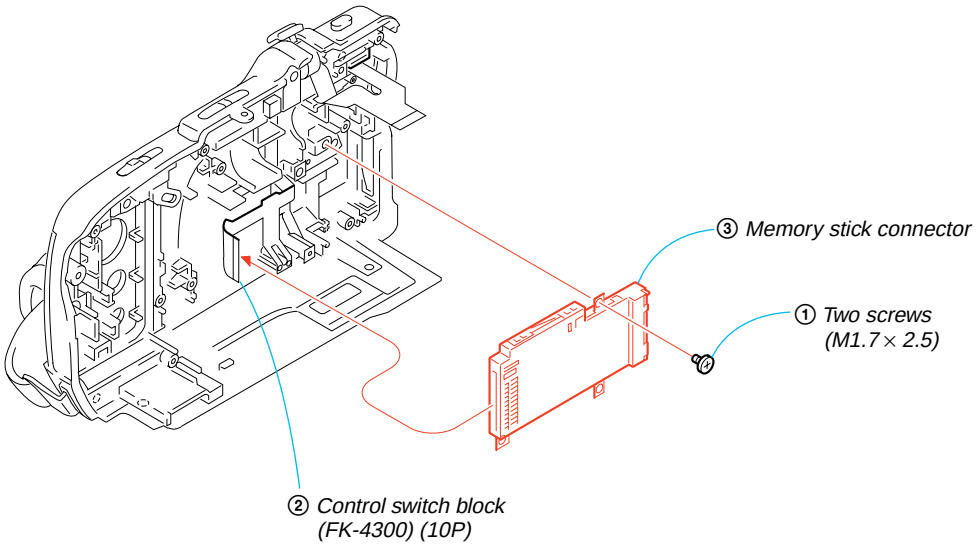
2-25. CS FRAME ASSEMBLY


② Zoom cover
① Two tapping screws (M1.7 × 5)
④ Grip cover
③ Two screws (M1.7 × 2.5)
⑤ FP-645 flexible board (15P)
⑥ Five tapping screws (M1.7 × 5)
Caution
Routing of the FP-645 board
L sheet
FP-645 flexible board
⑦ L sheet
⑩ CS frame assembly
⑨ FP-645 board
⑧ Screw (M1.7 × 2.5)

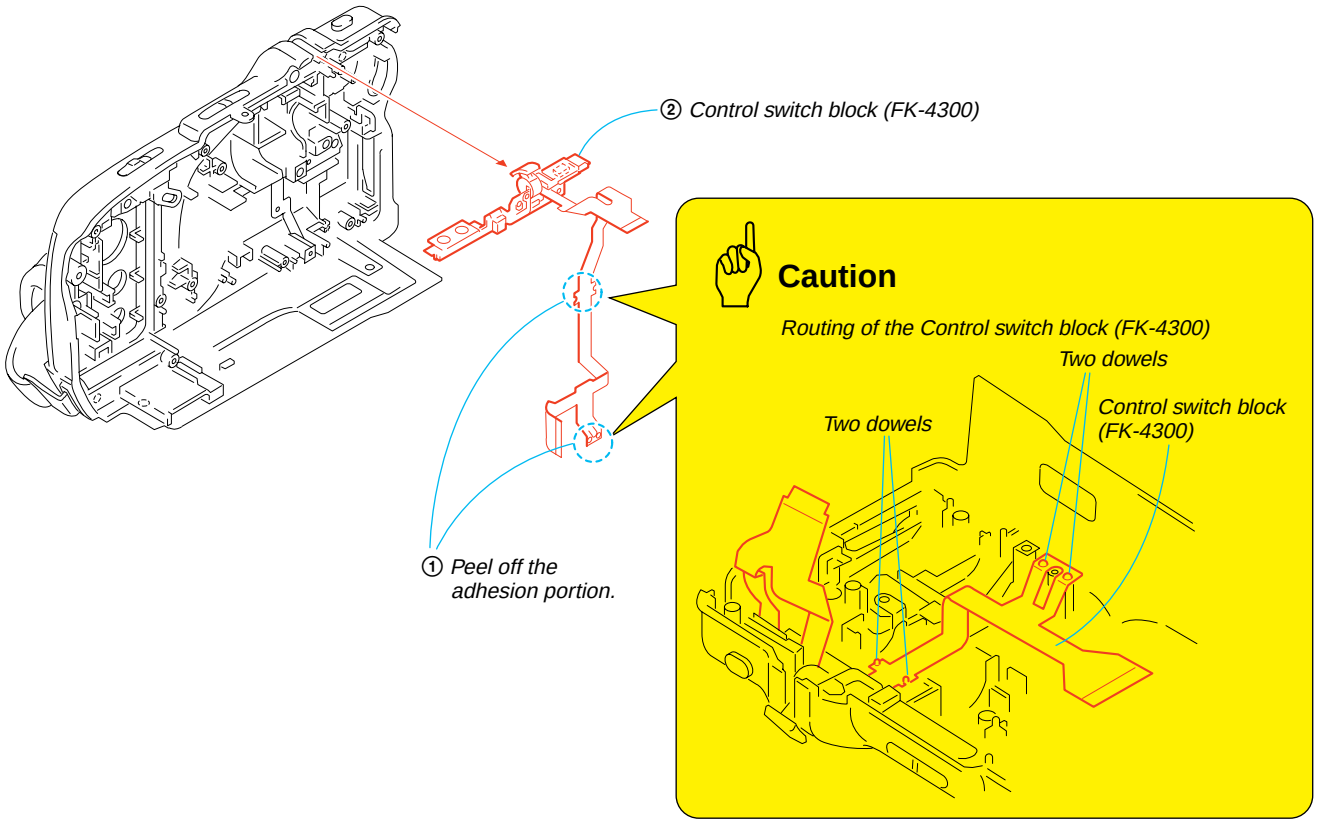
2-26. CONTROL SWITCH BLOCK (PS-2890)



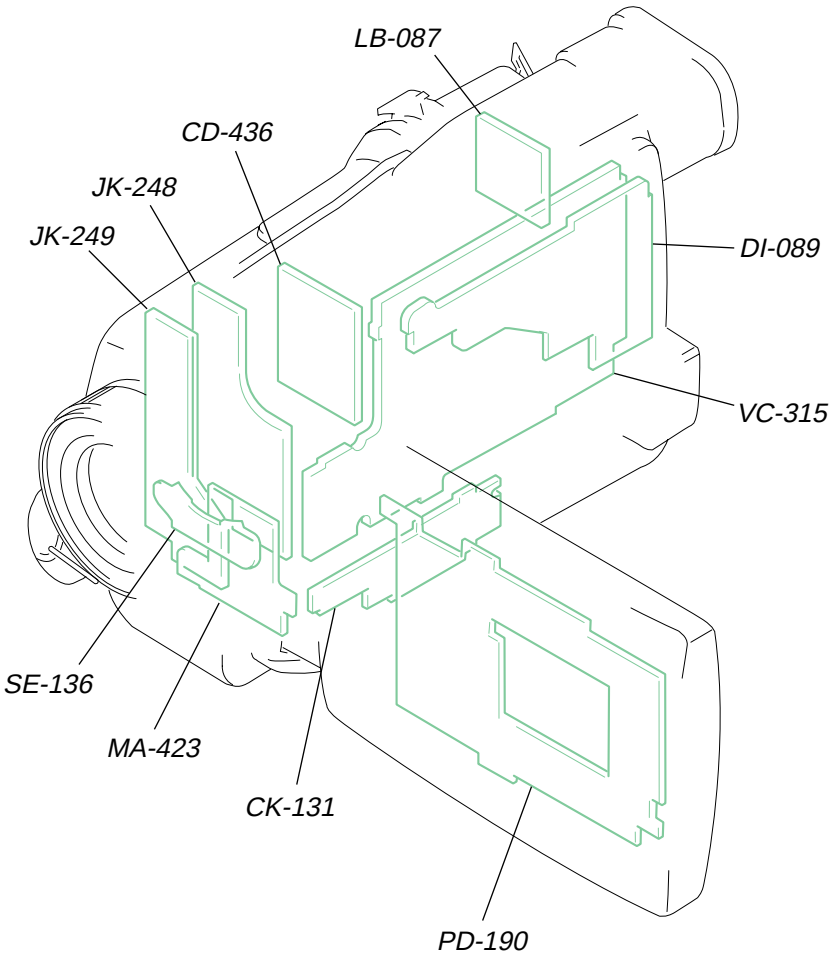
2-27. MEMORY STICK CONNECTOR



2-28. CONTROL SWITCH BLOCK (FK-4300)



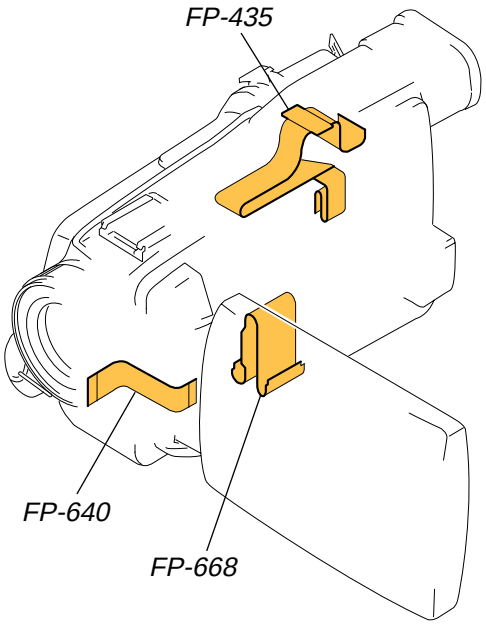
2-29. CIRCUIT BOARDS LOCATION

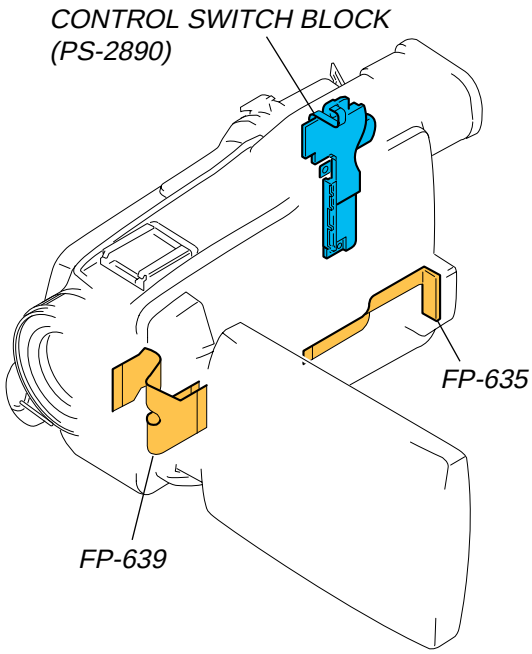


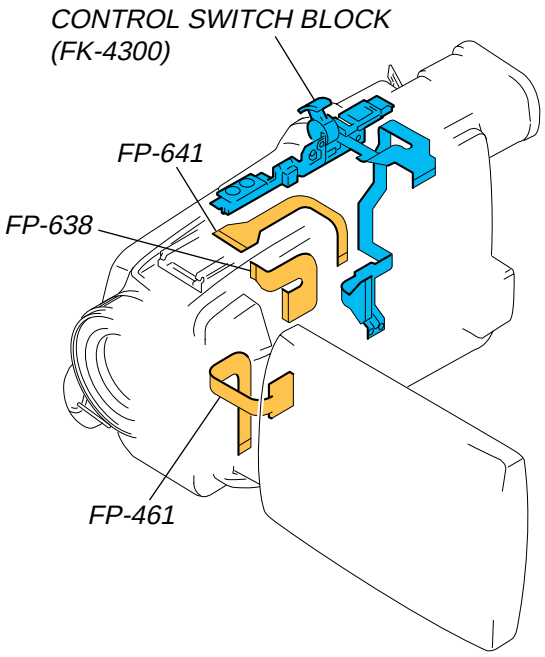
NAME	FUNCTION
CD-436	CCD IMAGER
CK-131	FUNCTION KEY
DI-089	CHARGE, POWER IN, EVF DRIVER, TIMING GEN., DC-DC CONVERTER
JK-248	P/Y SENSOR, A/V IN/OUT
JK-249	DV IN/OUT, MIC IN
LB-087	EVF, BACK LIGHT
MA-423	MIC IN, REMOTE CONTROL RECEIVER
PD-190	LCD DRIVER, TIMING GEN., LCD DRIVER, LCD BACK LIGHT
SE-136	MF SENSOR
VC-315	CAMERA PROCESS, MPEG/DIGITAL STILL PROCESS, SERVO PROCESSOR, CAMERA/ MECHA/HI CONTROL, USB SIGNAL PROCESSOR, A/D CONVERTER, TIMING GENE., FOCUS/ZOOM/IRIS ND CONTROL, CAMERA/DV SIGNAL/MPEG MOVIE/DIGITAL STILL/ AUDIO SIGNAL PROCESSOR, FLASH MEMORY/SDRAM, DV SIGNAL PROCESSOR, DV INTERFACE, REC/PB HEAD AMP, VIDEO IN/OUT AGC, AUDIO MIC AMP, AUDIO IN/ OUT INTERFACE, AUDIO A/D-D/A CONVERTER, CONNECTOR

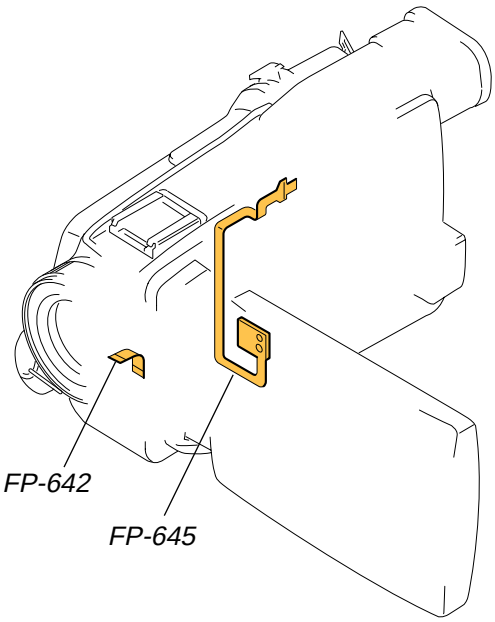
2-30. FLEXIBLE BOARDS LOCATION

The flexible boards contained in the mechanism deck and that in the lens device are not shown.







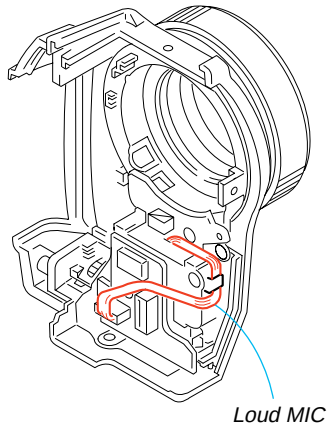


2003.02.13

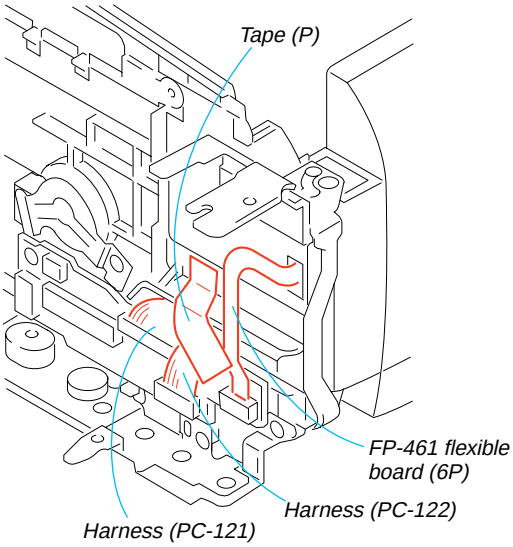
HELP

Sheet attachment positions and procedures of processing the flexible boards/harnesses are shown.

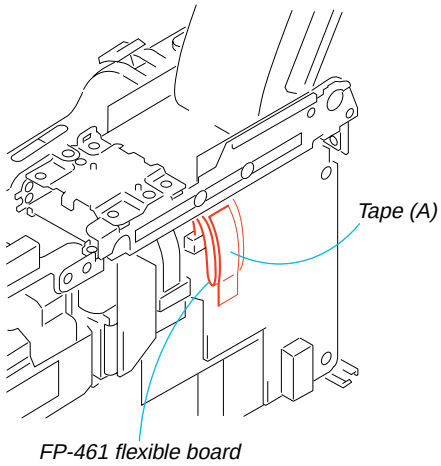
FRONT PANEL SECTION

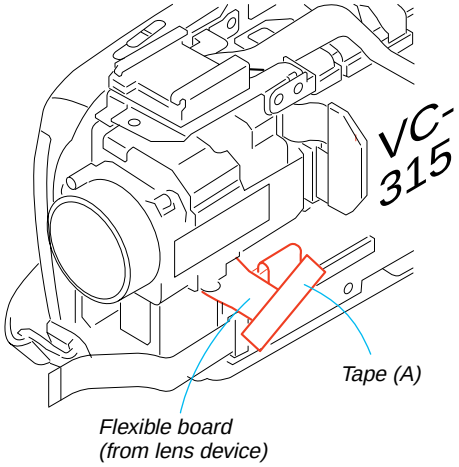


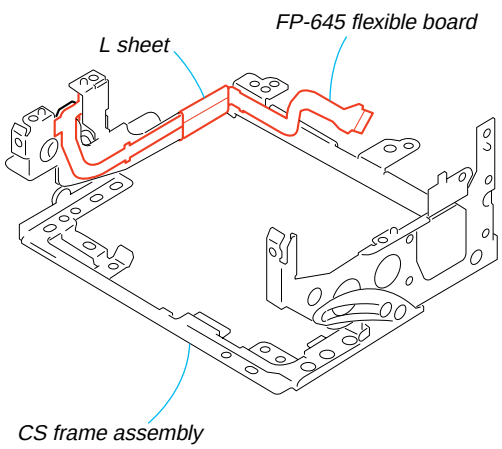
CABINET (R) SECTION

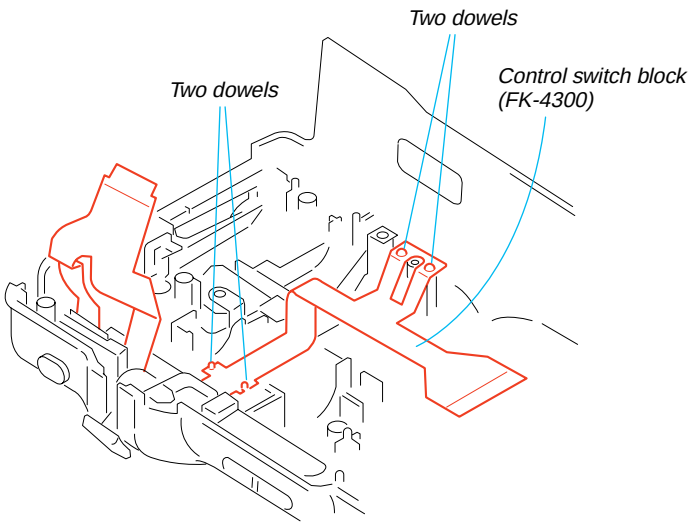


CABINET (L) SECTION

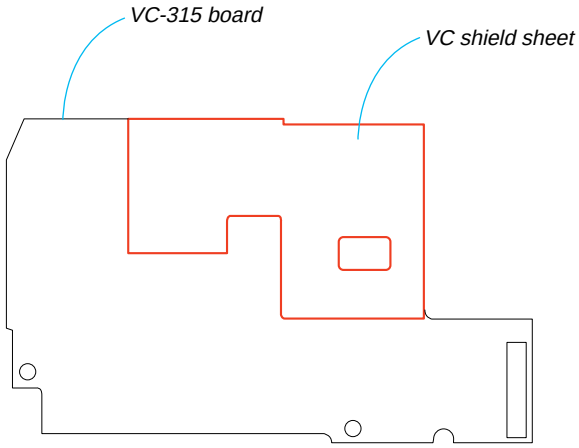




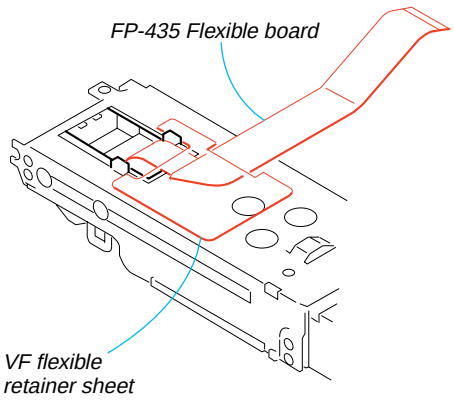


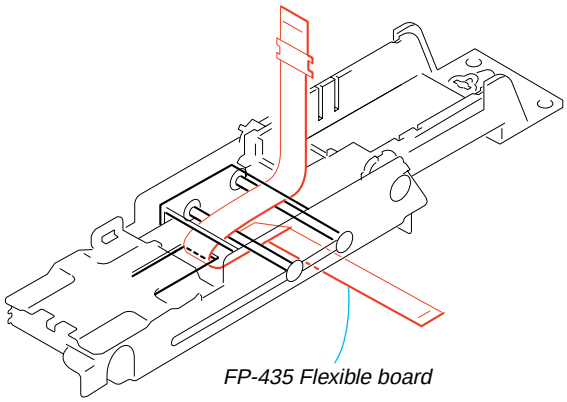


CABINET (L) SECTION

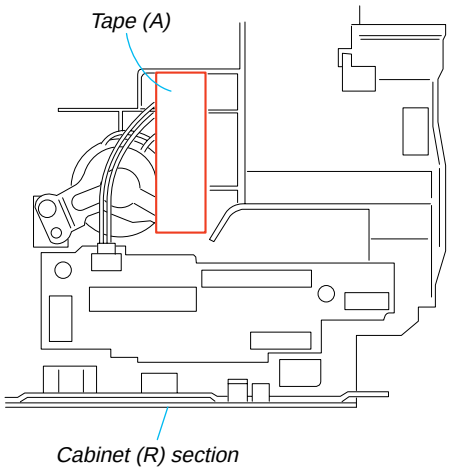


EVF SECTION





CABINET (R) SECTION



HELP

COVER

3. BLOCK DIAGRAMS

Link

OVERALL BLOCK DIAGRAM (1/4)	POWER BLOCK DIAGRAM (1/2)
OVERALL BLOCK DIAGRAM (2/4)	POWER BLOCK DIAGRAM (2/2)
OVERALL BLOCK DIAGRAM (3/4)	
OVERALL BLOCK DIAGRAM (4/4)	

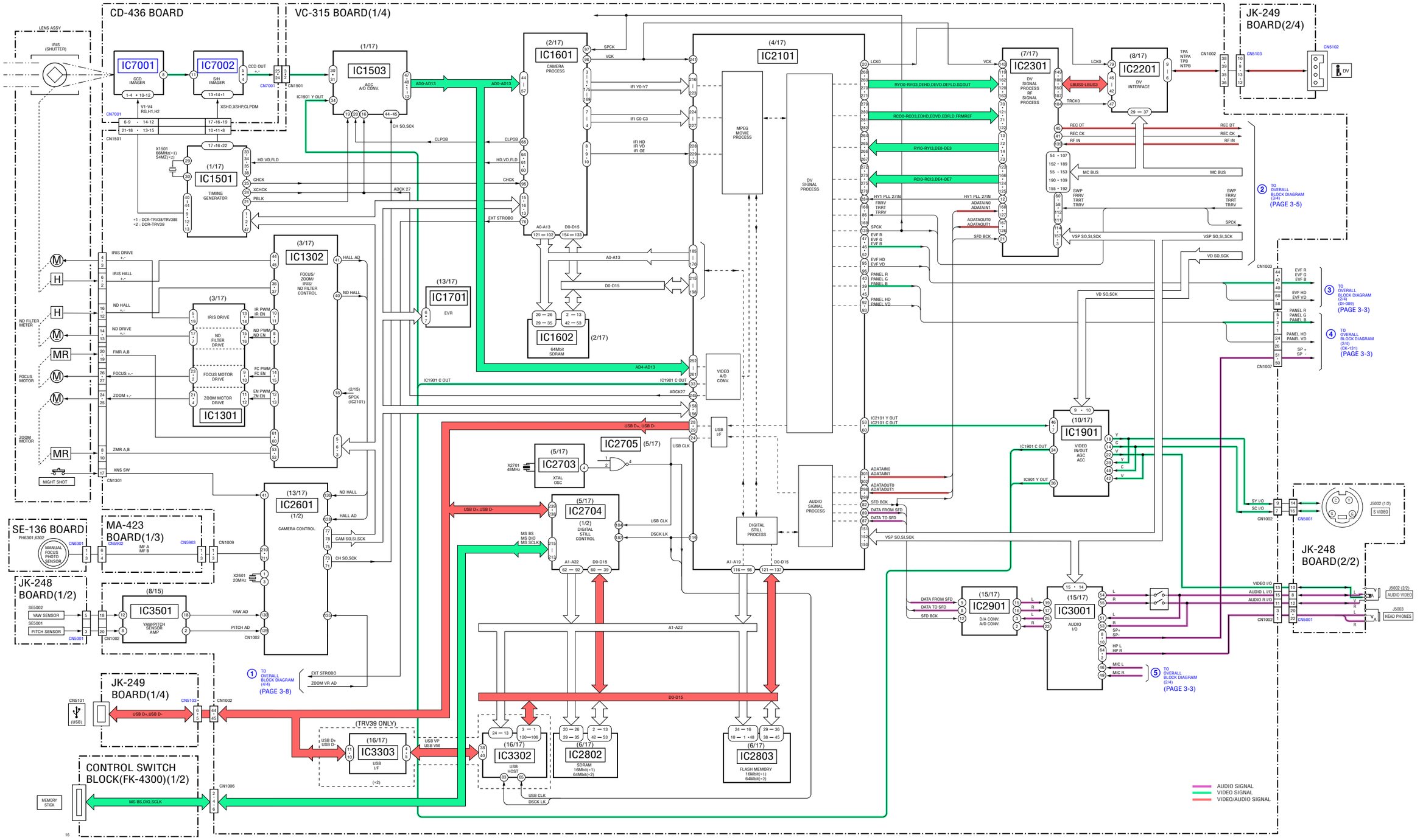
COVER

SECTION 3
BLOCK DIAGRAMS

3. BLOCK DIAGRAMS

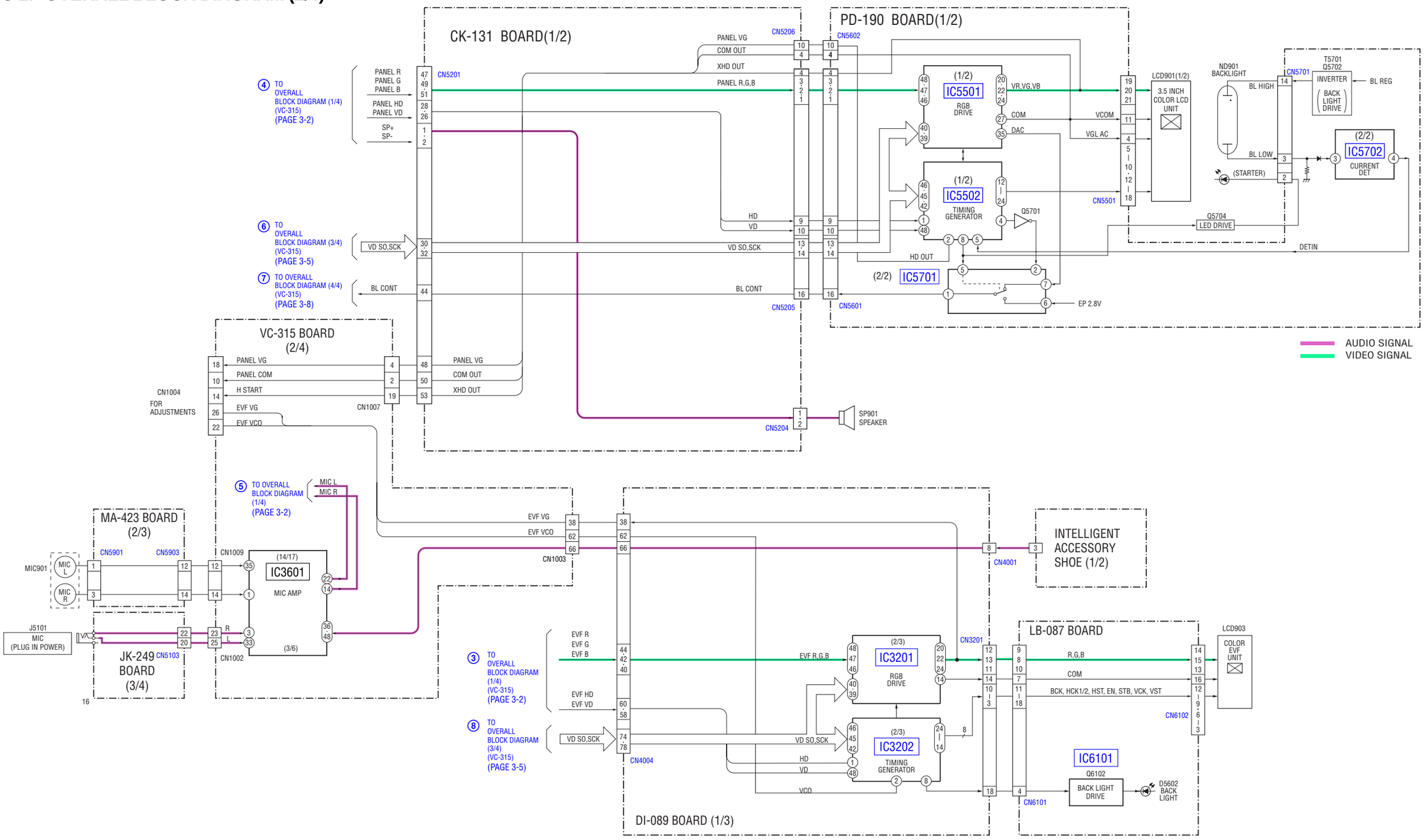
3-1. OVERALL BLOCK DIAGRAM (1/4)

( ) : Number in parenthesis ( ) indicates the division number of schematic diagram where the component is located.



3-2. OVERALL BLOCK DIAGRAM (2/4)

( ) : Number in parenthesis ( ) indicates the division number of schematic diagram where the component is located.

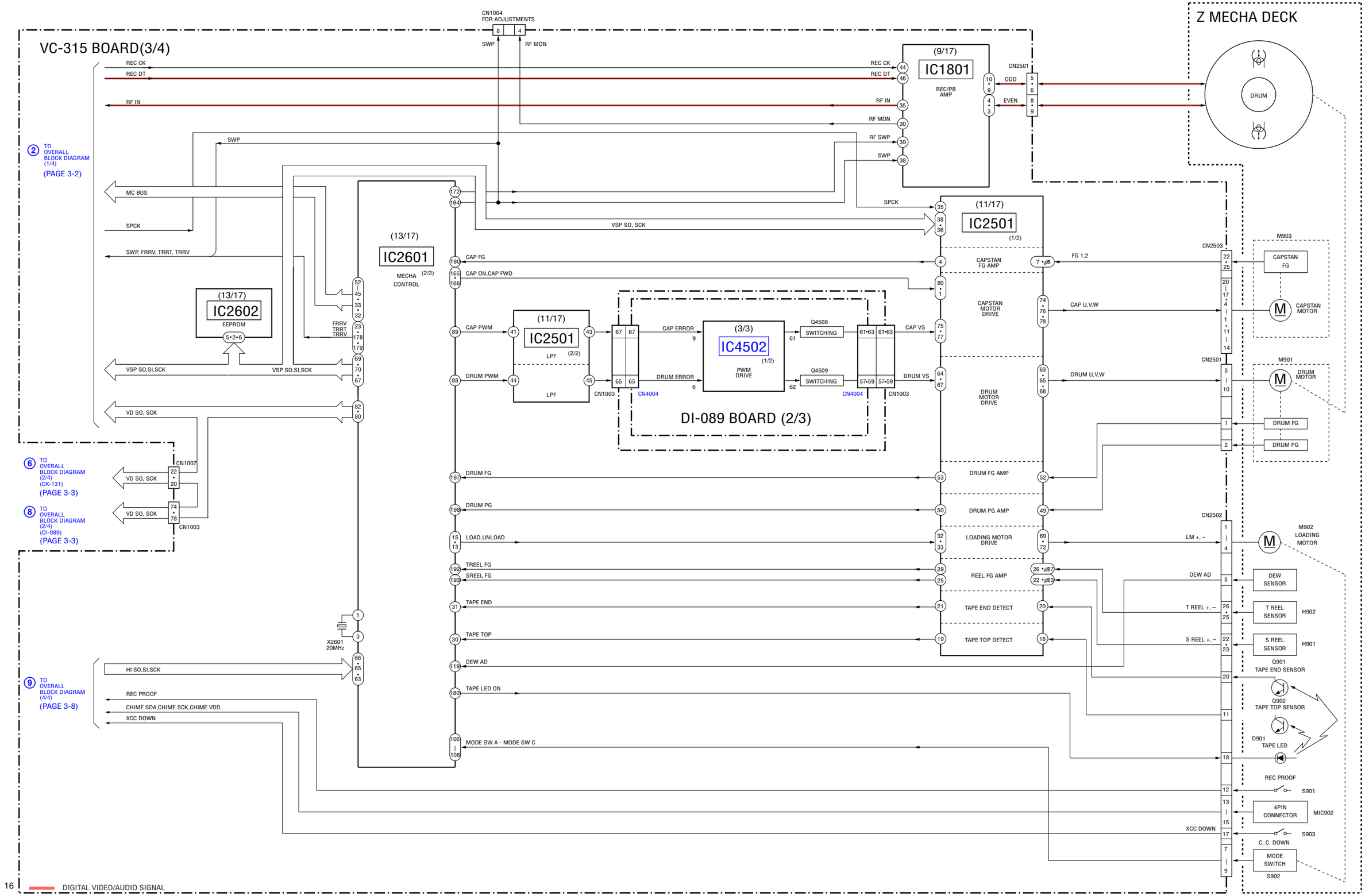


COVER

3. BLOCK DIAGRAMS

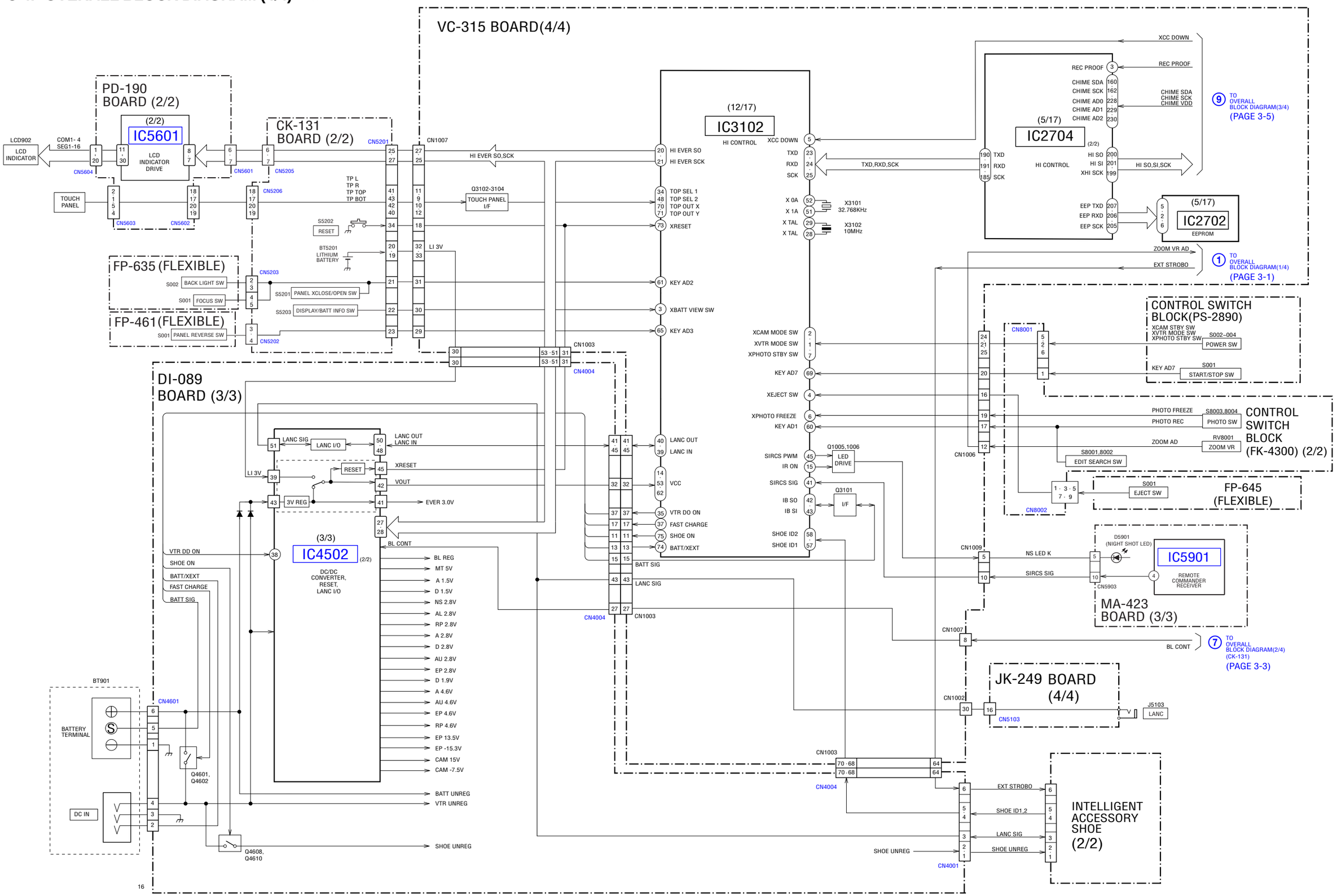
3-3. OVERALL BLOCK DIAGRAM (3/4)

( ) : Number in parenthesis ( ) indicates the division number of schematic diagram where the component is located.



3-4. OVERALL BLOCK DIAGRAM (4/4)

( ) : Number in parenthesis ( ) indicates the division number of schematic diagram where the component is located.

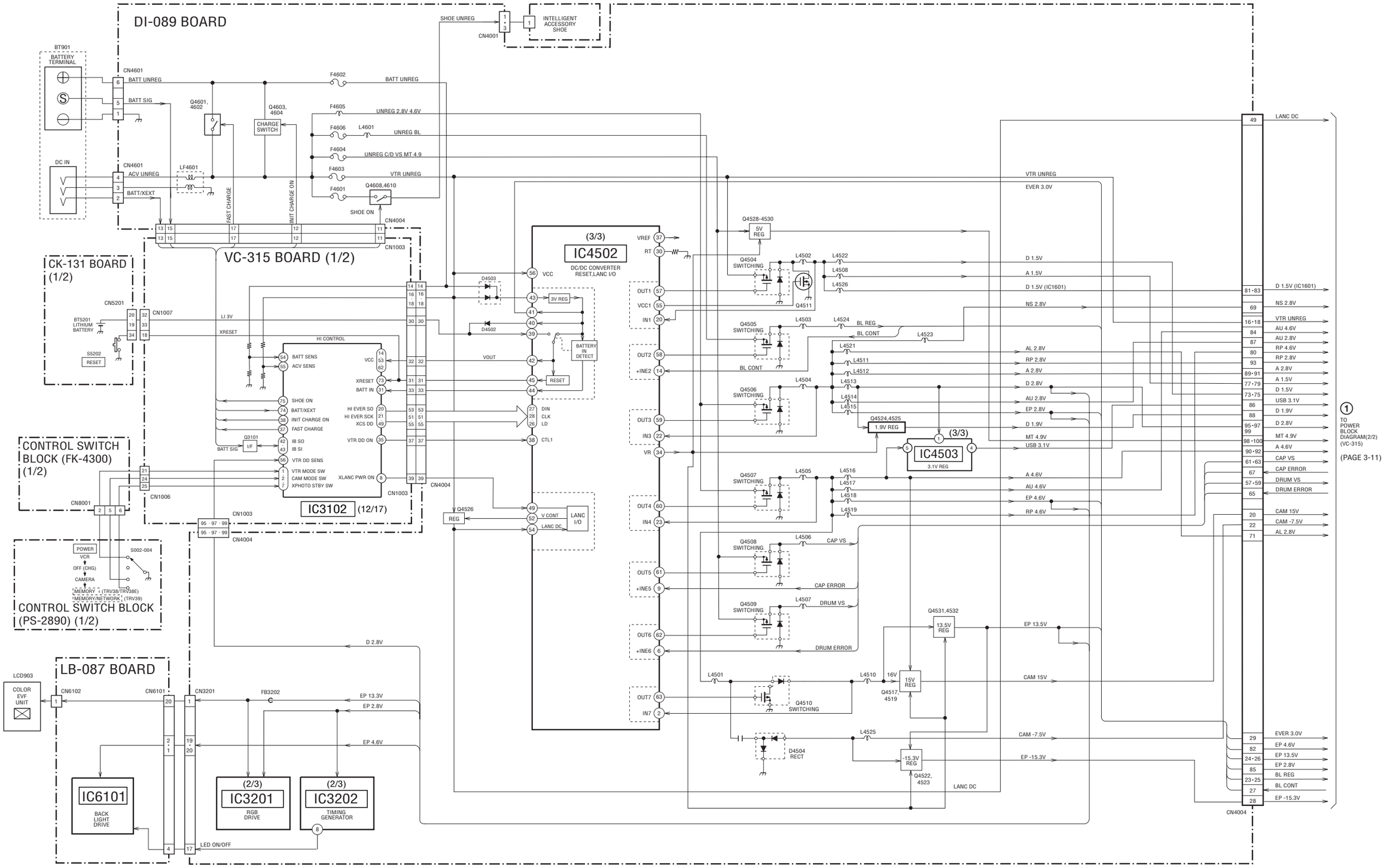


COVER

3. BLOCK DIAGRAMS

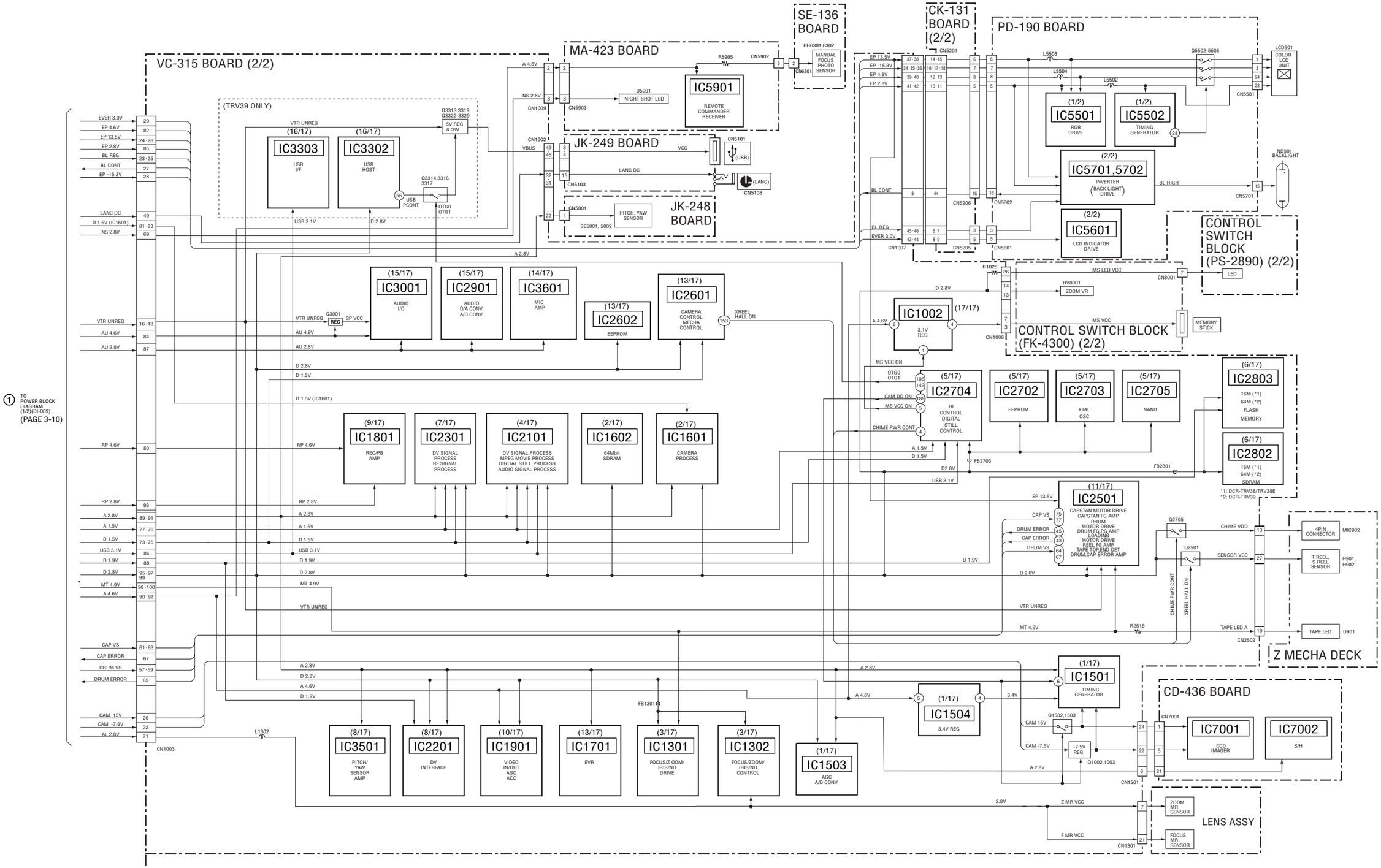
3-5. POWER BLOCK DIAGRAM (1/2)

( ) : Number in parenthesis ( ) indicates the division number of schematic diagram where the component is located.



3-6. POWER BLOCK DIAGRAM (2/2)

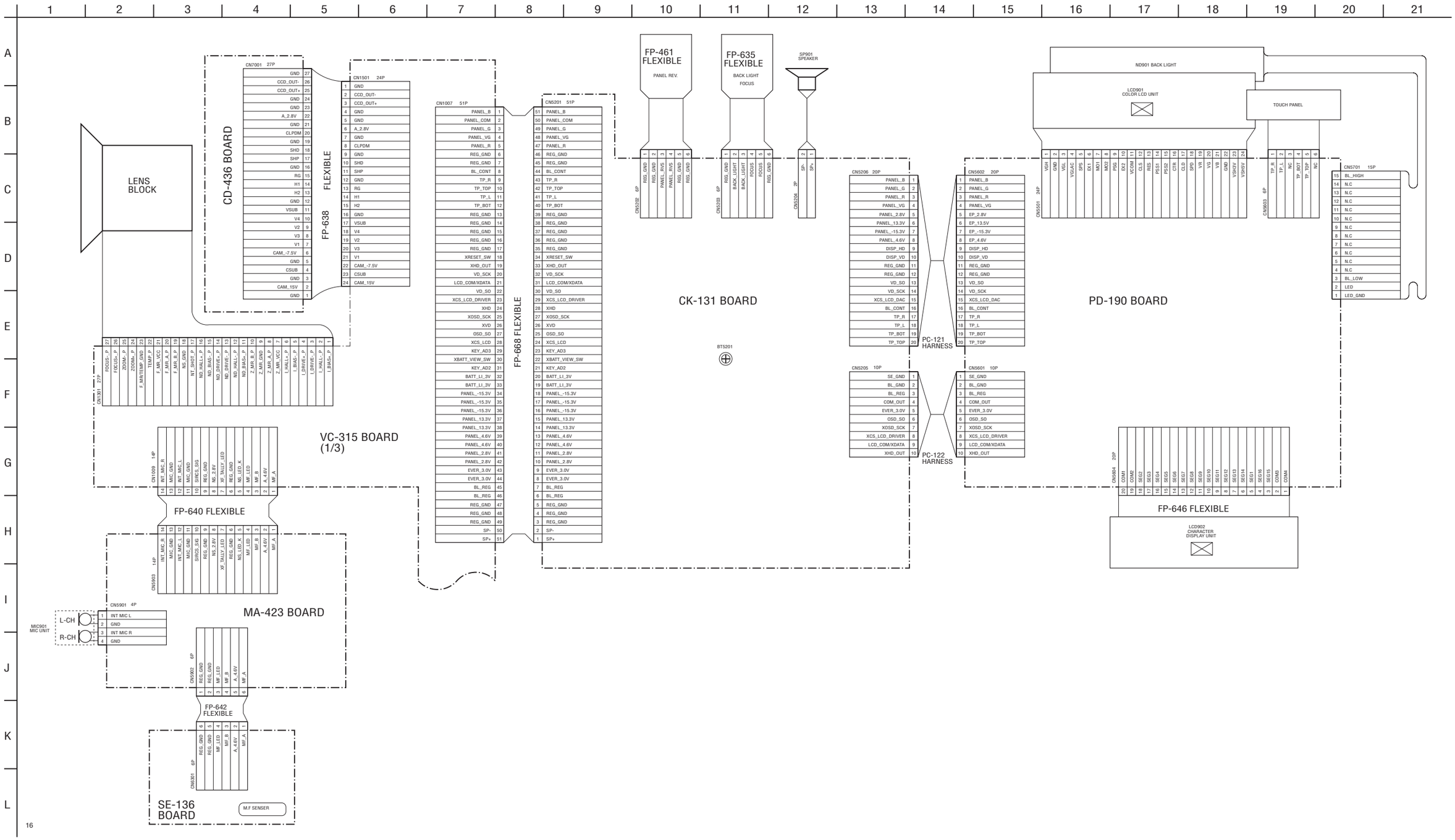
( ) : Number in parenthesis ( ) indicates the division number of schematic diagram where the component is located.



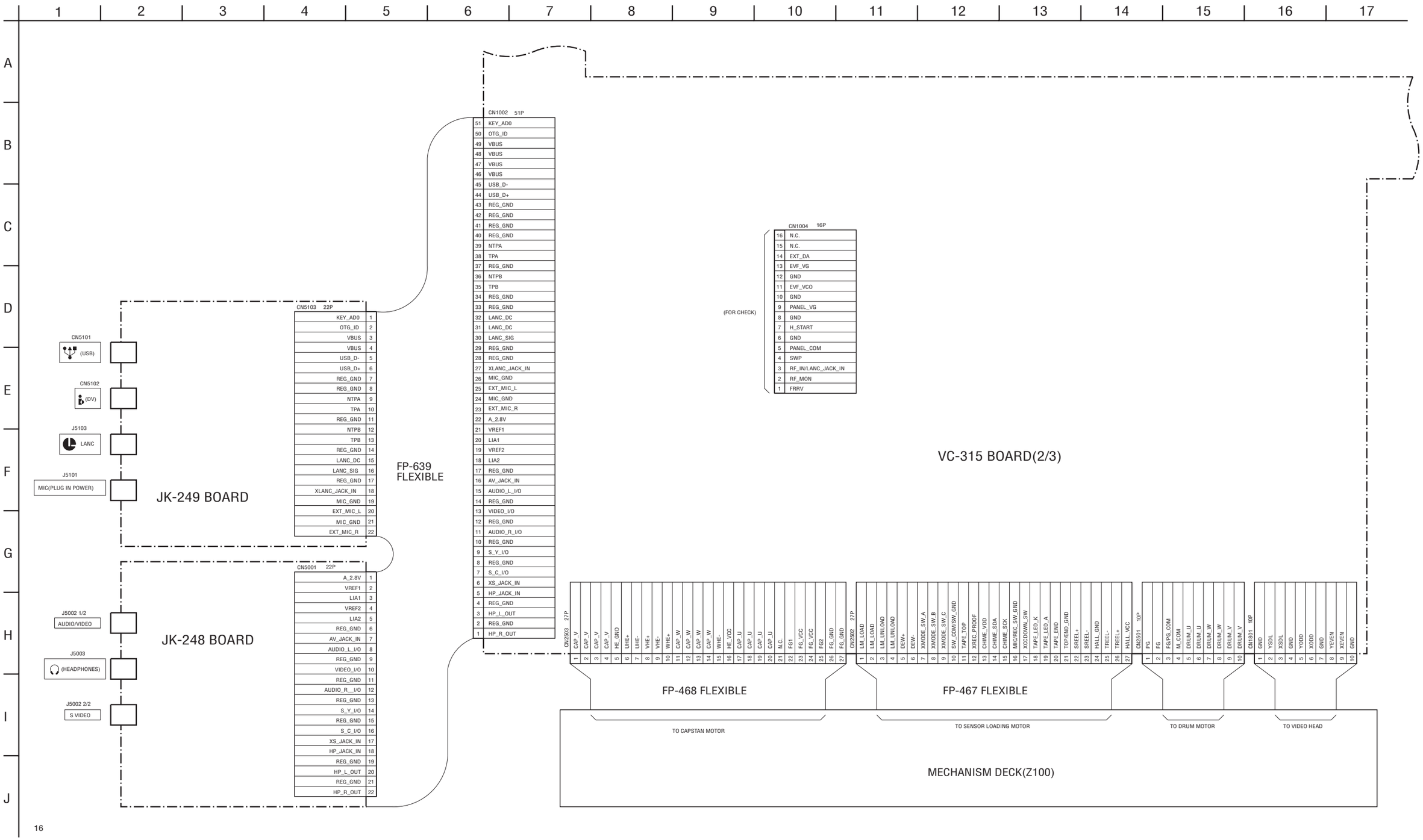
1 TO POWER BLOCK DIAGRAM (1/2)(DI-089) (PAGE 3-10)

SECTION 4
PRINTED WIRING BOARDS AND SCHEMATIC DIAGRAMS

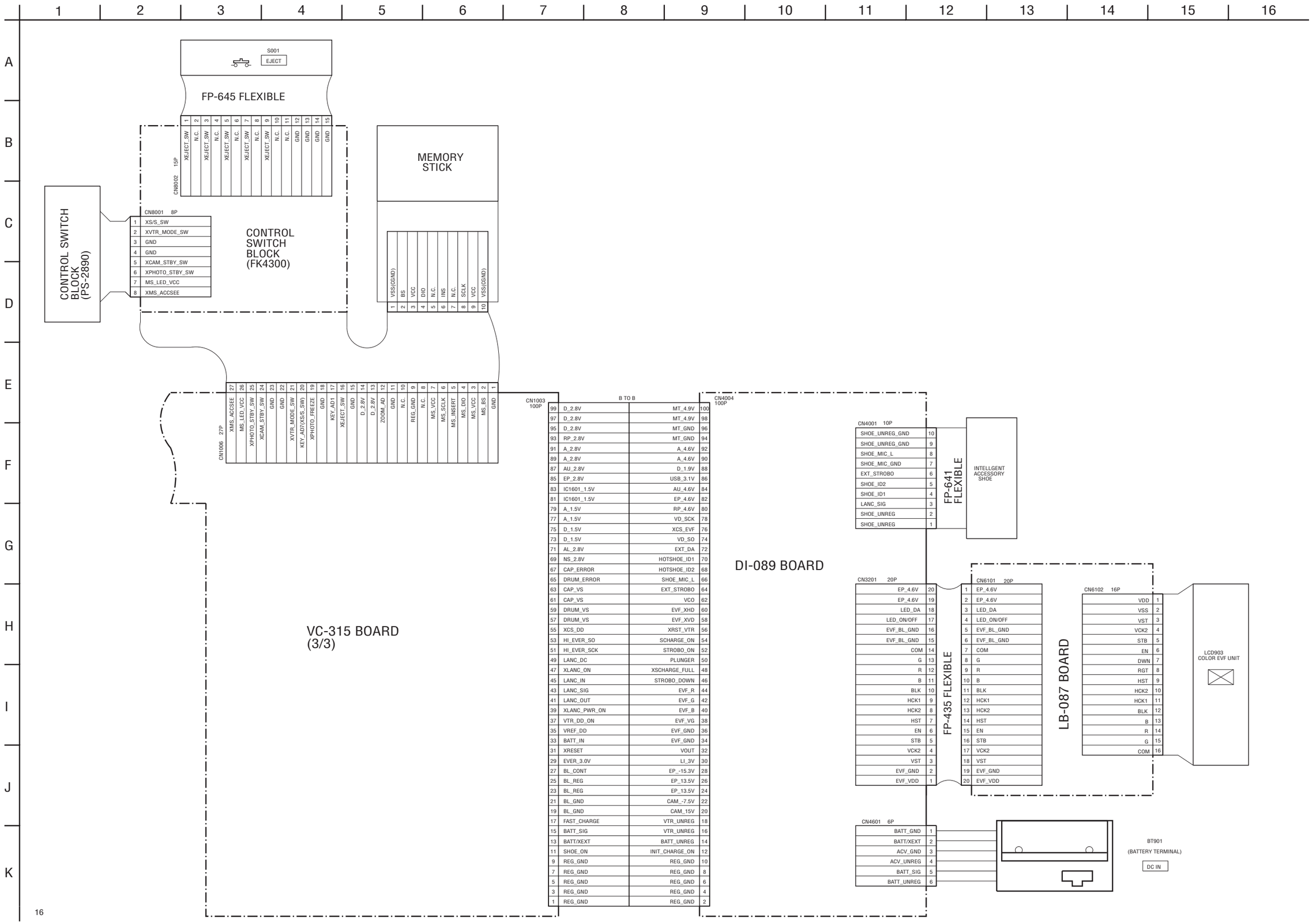
4-1. FRAME SCHEMATIC DIAGRAM (1/3)



FRAME SCHEMATIC DIAGRAM (2/3)



FRAME SCHEMATIC DIAGRAM (3/3)



COVER

4-2. SCHEMATIC DIAGRAMS

Link

- CD-436 BOARD (CCD IMAGER)
- MA-423 BOARD (MIC IN, REMOCON REC)
- LB-087 BOARD (EVF, BACKLIGHT)
- JK-248 BOARD (P/Y SENSOR, A/V-IN)
- DI-089 BOARD (1/3) (CHARGE, POWER IN)
- FP-639 FLEXIBLE BOARD
- DI-089 BOARD (2/3) (EVF DRIVER, TIMING GEN.)
- JK-249 BOARD (MIC IN, DV IN/OUT)
- DI-089 BOARD (3/3) (DC/DC CONVERTER)
- CK-131 BOARD (FUNTION KEY)
- PD-190 BOARD (1/2) (LCD DRIVER, TIMING GEN.)
- CONTROL SWITCH BLOCK (FK4300)
- PD-190 BOARD (2/2) (LCD BACKLIGHT)
- FP-228, FP-467, FP-468 FLEXIBLE BOARD

- COMMON NOTE FOR SCHEMATIC DIAGRAMS
- WAVEFORMS

COVER

4-2. SCHEMATIC DIAGRAMS

THIS NOTE IS COMMON FOR SCHEMATIC DIAGRAMS
(In addition to this, the necessary note is printed in each block)

(For schematic diagrams)

- All capacitors are in μF unless otherwise noted. pF : μμF. 50 V or less are not indicated except for electrolytics and tantalums.
- Chip resistors are 1/10 W unless otherwise noted. kΩ=1000 Ω, MΩ=1000 kΩ.
- Caution when replacing chip parts.
  New parts must be attached after removal of chip.
  Be careful not to heat the minus side of tantalum capacitor, Because it is damaged by the heat.
- Some chip part will be indicated as follows.

Example

C541	L452
22U	10UH
TA A	2520

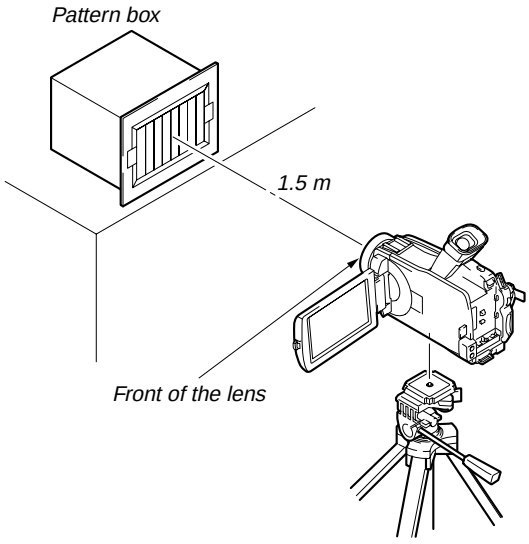
Kinds of capacitor
Temperature characteristics
External dimensions (mm)

- Constants of resistors, capacitors, ICs and etc with XX indicate that they are not used.
  In such cases, the unused circuits may be indicated.
- Parts with * differ according to the model/destination.
  Refer to the mount table for each function.
- All variable and adjustable resistors have characteristic curve B, unless otherwise noted.
- Signal name
  XEDIT → $\overline{\text{EDIT}}$ PB/XREC → PB/$\overline{\text{REC}}$
- : non flammable resistor
- : fusible resistor
- : panel designation
- : B+ Line
- : B– Line
- : IN/OUT direction of (+,–) B LINE.
- : adjustment for repair.
- : VIDEO SIGNAL (ANALOG)
- : AUDIO SIGNAL (ANALOG)
- : VIDEO/AUDIO SIGNAL
- : VIDEO/AUDIO/SERVO SIGNAL
- : SERVO SIGNAL
- Circled numbers refer to waveforms.

(Measuring conditions voltage and waveform)

- Voltages and waveforms are measured between the measurement points and ground when camera shoots color bar chart of pattern box. They are reference values and reference waveforms.
  (VOM of DC 10 MΩ input impedance is used)
- Voltage values change depending upon input impedance of VOM used.)

1. Connection



2. Adjust the distance so that the output waveform of Fig. a and the Fig. b can be obtain.

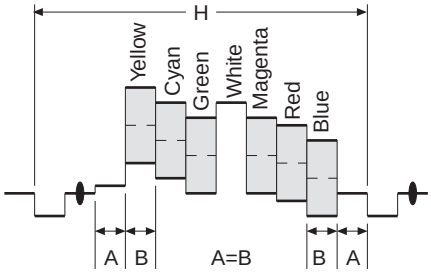


Fig. a (Video output terminal output waveform)

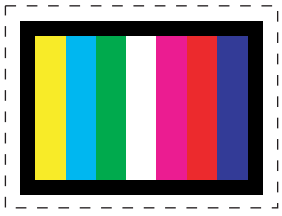


Fig.b (Picture on monitor TV)

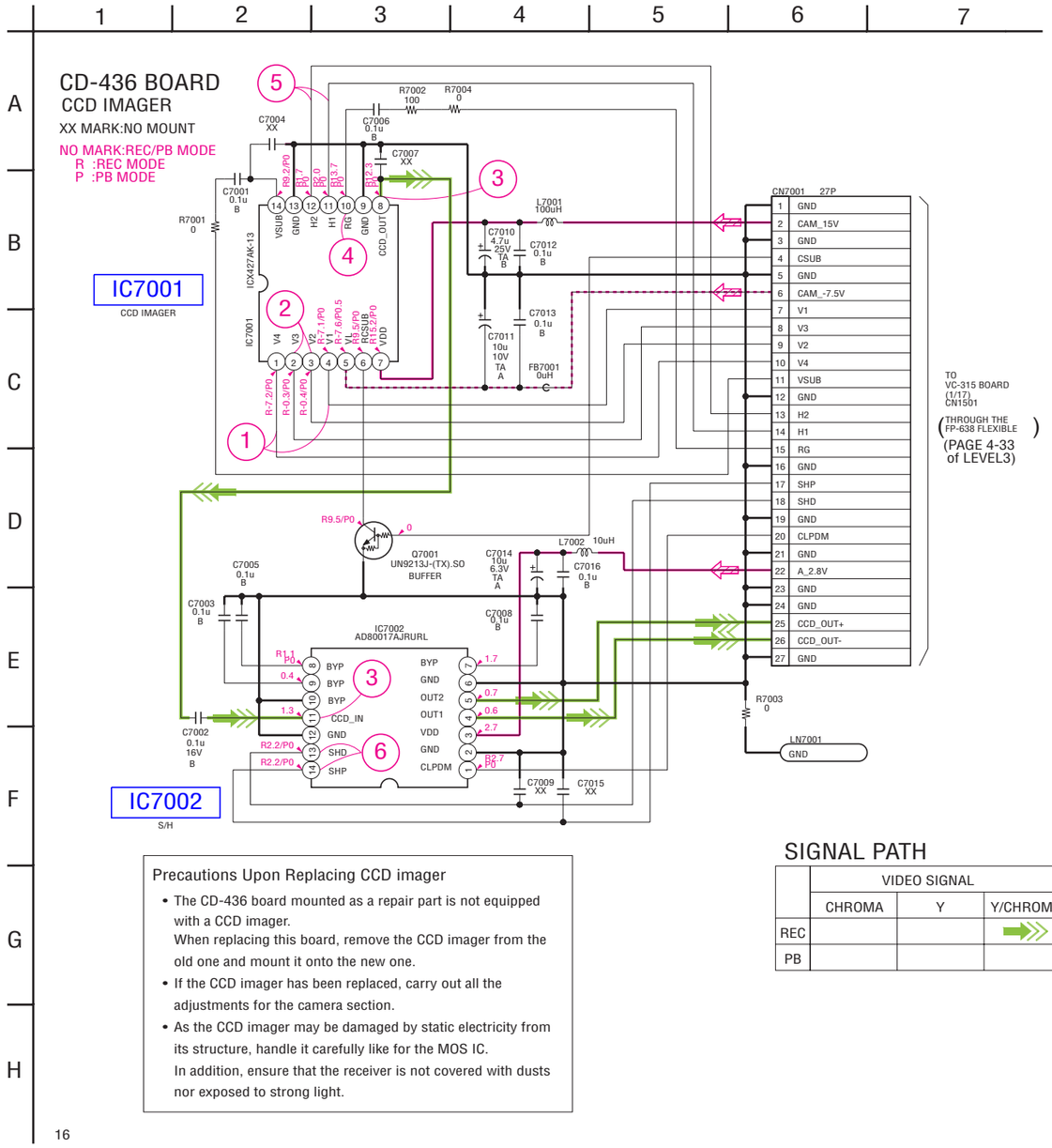
When indicating parts by reference number, please include the board name.

Note : The components identified by mark or dotted line with mark are critical for safety. Replace only with part number specified.	**Note :** Les composants identifiés par une marque sont critiques pour la sécurité. Ne les remplacer que par une pièce portant le numéro spécifié.

4-2. SCHEMATIC DIAGRAMS

For Schematic Diagram

• Refer to page 4-69 for printed wiring board of CD-436 board.
• Refer to page 4-70 for printed wiring board of LB-087 board.

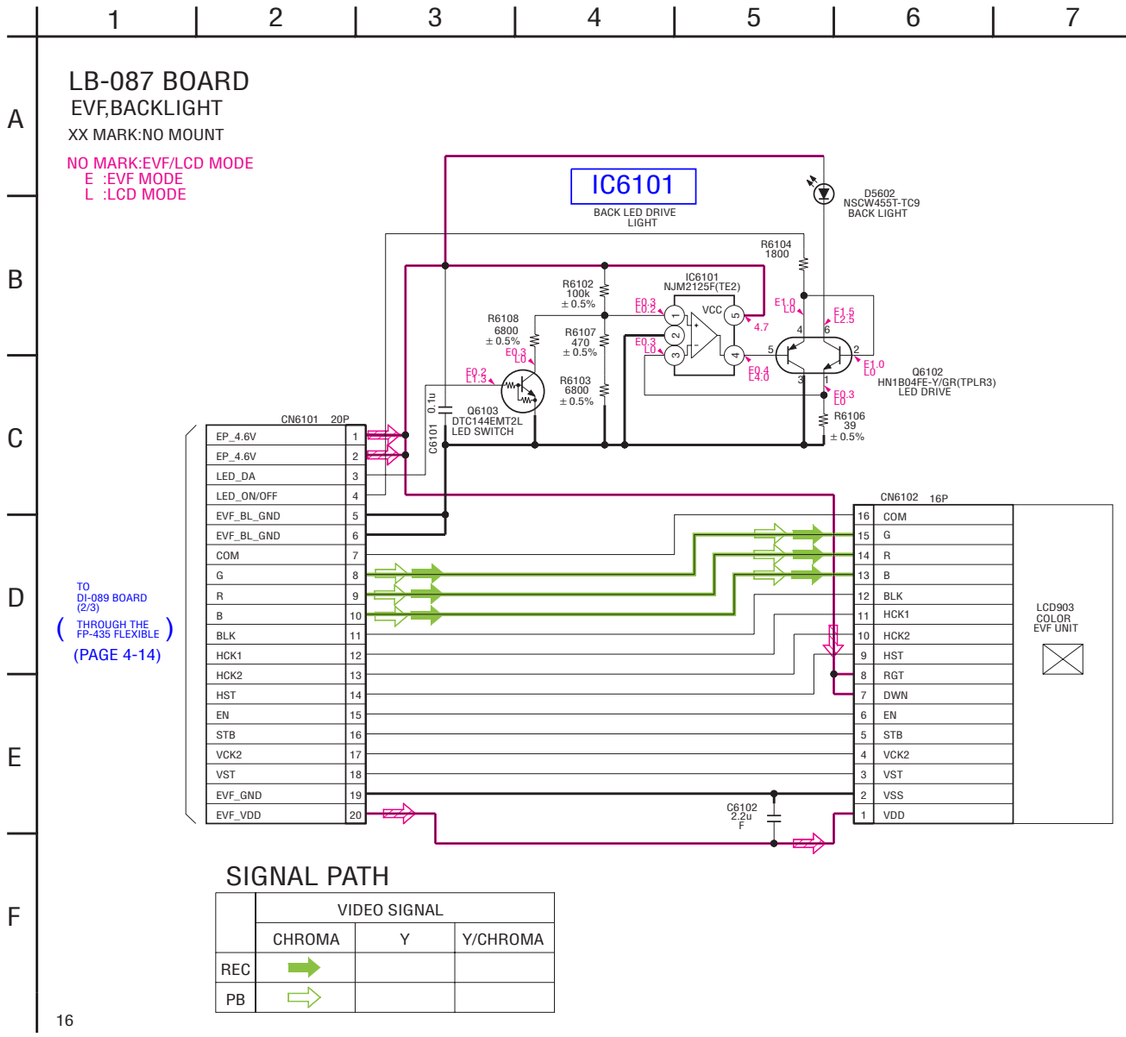


Precautions Upon Replacing CCD imager

- The CD-436 board mounted as a repair part is not equipped with a CCD imager.
  When replacing this board, remove the CCD imager from the old one and mount it onto the new one.
- If the CCD imager has been replaced, carry out all the adjustments for the camera section.
- As the CCD imager may be damaged by static electricity from its structure, handle it carefully like for the MOS IC.
  In addition, ensure that the receiver is not covered with dusts nor exposed to strong light.

SIGNAL PATH

	VIDEO SIGNAL		
	CHROMA	Y	Y/CHROMA
REC			⇛
PB			

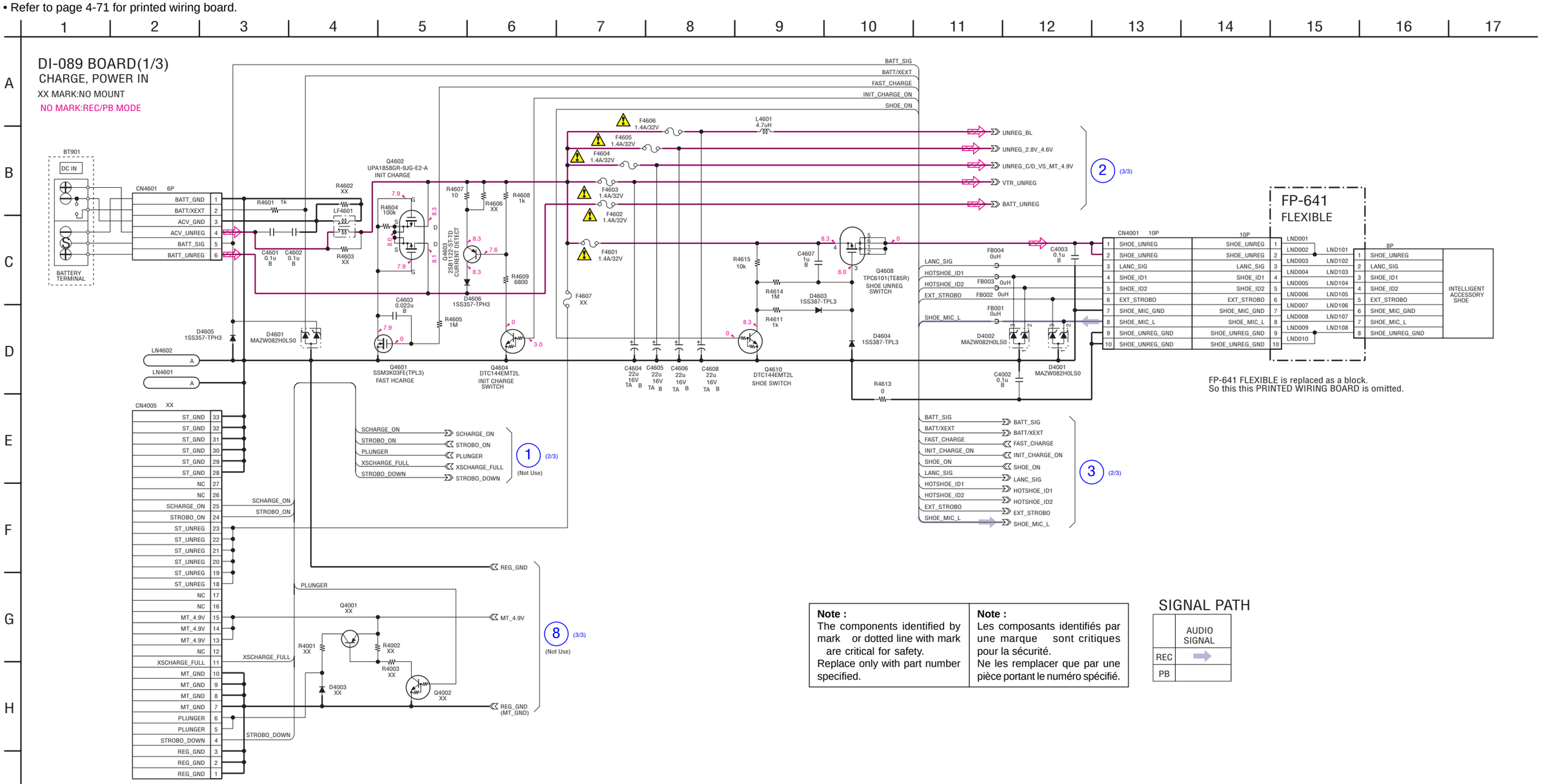


SIGNAL PATH

	VIDEO SIGNAL		
	CHROMA	Y	Y/CHROMA
REC	⇒		
PB	⇨		

For Schematic Diagram

• Refer to page 4-71 for printed wiring board.



Note :	Note :
The components identified by mark or dotted line with mark are critical for safety. Replace only with part number specified.	Les composants identifiés par une marque sont critiques pour la sécurité. Ne les remplacer que par une pièce portant le numéro spécifié.

SIGNAL PATH

	AUDIO SIGNAL
REC	➡
PB	

For Schematic Diagram

• Refer to page 4-71 for printed wiring board.

DI-089 BOARD(2/3)

EVF DRIVER,TIMING GEN.(EVF BLOCK)

XX MARK:NO MOUNT

NO MARK:REC/PB MODE

IC3201

EVF

IC3201
CXA3289BR-T4

IC3202

TIMING GENERATOR

IC3202
CXD3501AR-T4

SIGNAL PATH

	VIDEO SIGNAL			AUDIO SIGNAL
	CHROMA	Y	Y/CHROMA	
REC				
PB				

SIGNAL PATH

	REC	REC/PB	PB
Drum servo (speed and phase)			
Capstan servo (speed and phase)			

For Schematic Diagram

• Refer to page 4-71 for printed wiring board.

DI-089 BOARD(3/3)

DC-DC CONVERTER

XX MARK:NO MOUNT

NO MARK:REC/PB MODE
R :REC MODE
P :PB MODE

IC4502
DC-DC CONVERTER
IC4502
FA7713F-TE2

IC4503
USB3.1V REG

SIGNAL PATH

	REC	REC/PB	PB
Drum servo (speed and phase)			
Capstan servo (speed and phase)			

For Schematic Diagram

• Refer to page 4-75 for printed wiring board.

PD-190 BOARD(1/2)
LCD DRIVER,TIMING GEN.
XX MARK:NO MOUNT
NO MARK:REC/PB MODE

IC5501
LCD DRIVER
IC5501
AN12580A-BB

IC5502
TIMING GENERATOR
IC5502
LZ9FF474

SIGNAL PATH

	VIDEO SIGNAL		
	CHROMA	Y	Y/CHROMA
REC	⇨		
PB	⇨		

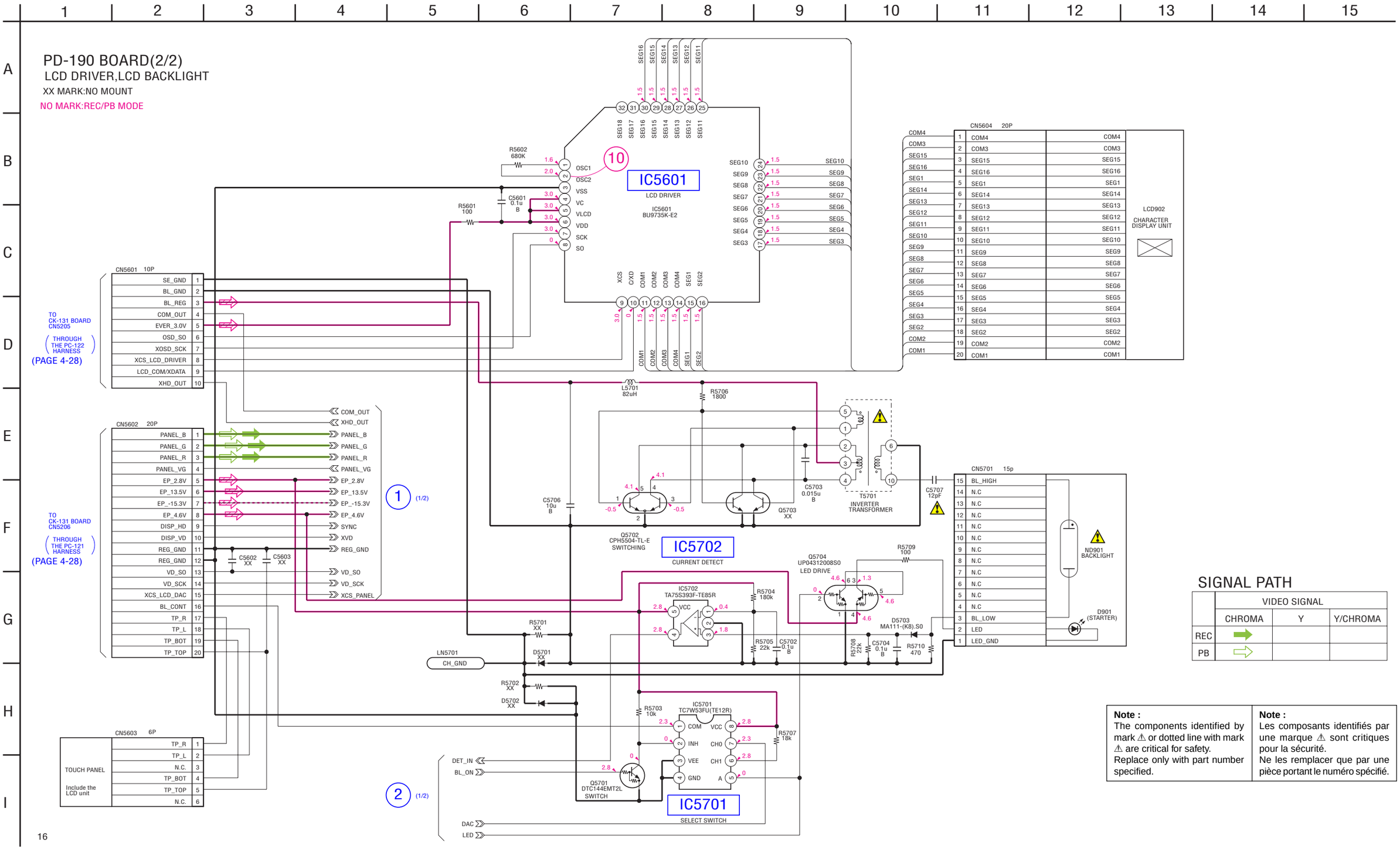
CN5501 24P

24	VSH5V
23	VSH3V
22	GND
21	VB
20	VG
19	VR
18	SPD
17	CLD
16	CTR
15	PSS2
14	PSS1
13	RES
12	CLS
11	VCOM
10	EX2
9	PSG
8	MO2
7	MO1
6	EX1
5	SPS
4	VGLAC
3	VGL
2	GND
1	VGH

LCD901
COLOR LCD UNIT
Include the

For Schematic Diagram

• Refer to page 4-75 for printed wiring board.



SIGNAL PATH

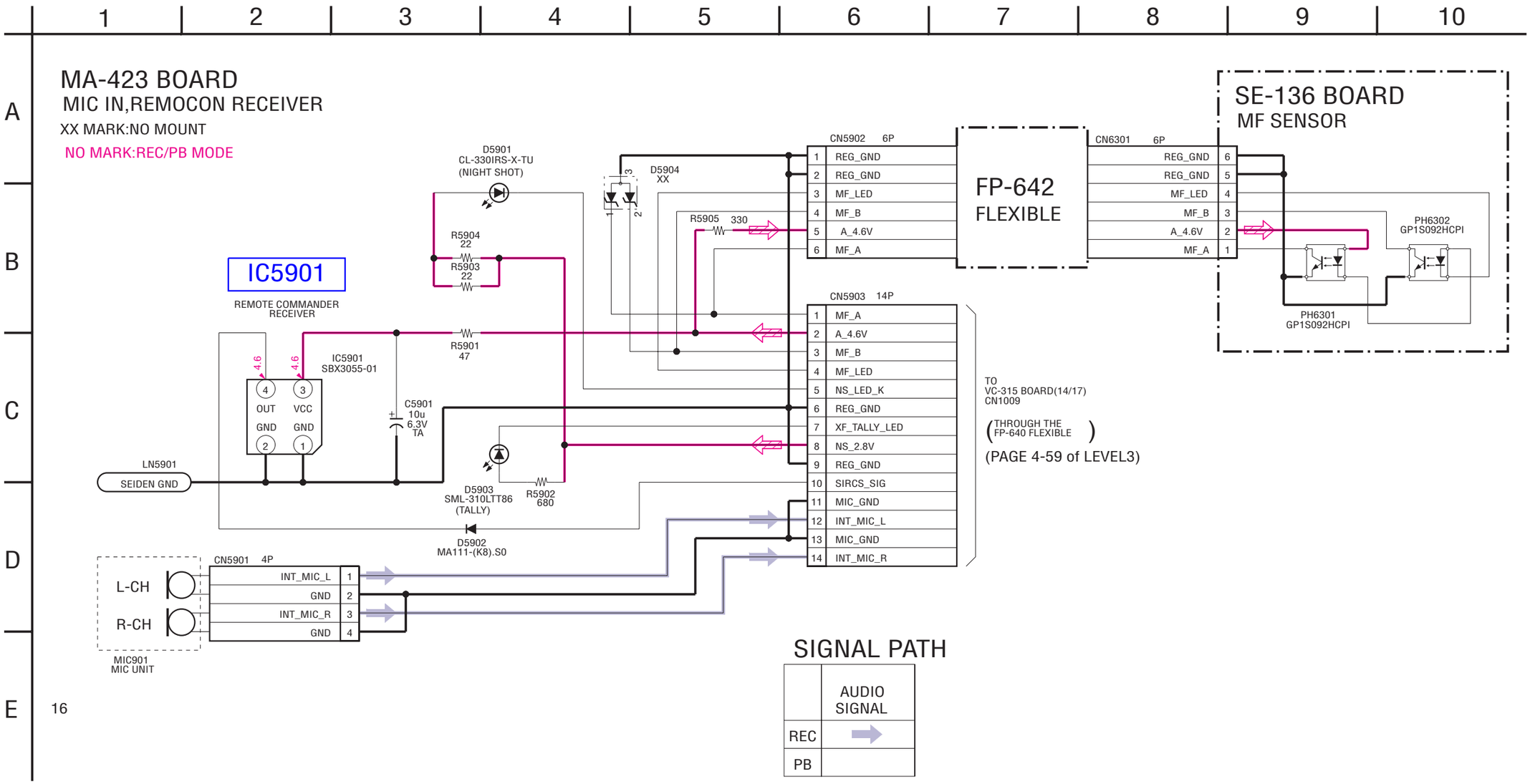
	VIDEO SIGNAL		
	CHROMA	Y	Y/CHROMA
REC	➡		
PB	⇨		

Note :
The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety.
Replace only with part number specified.

Note :
Les composants identifiés par une marque ⚠ sont critiques pour la sécurité.
Ne les remplacer que par une pièce portant le numéro spécifié.

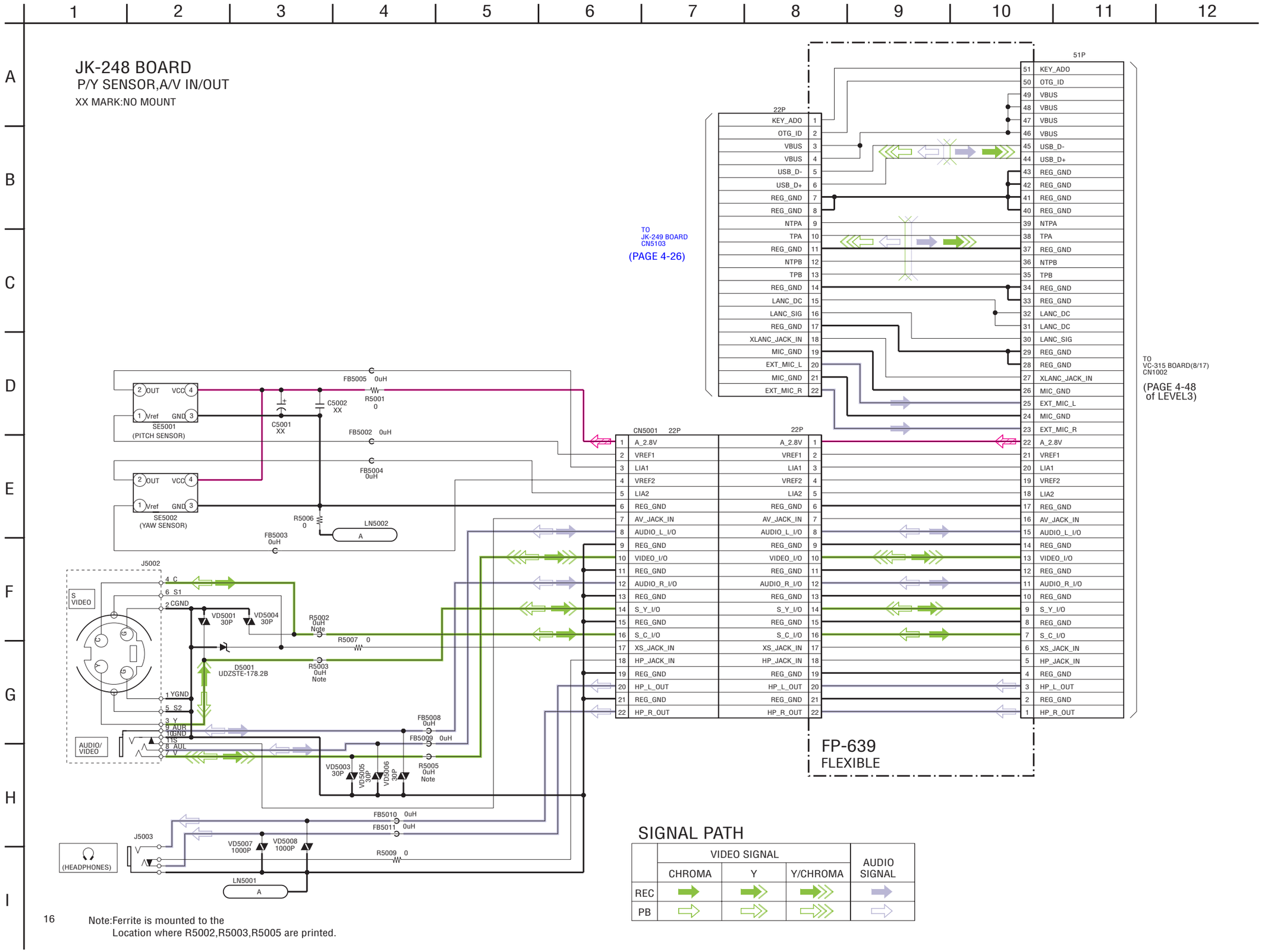
For Schematic Diagram

• Refer to page 4-77 for printed wiring board.



For Schematic Diagram

• Refer to page 4-79 for printed wiring board of JK-248 board.

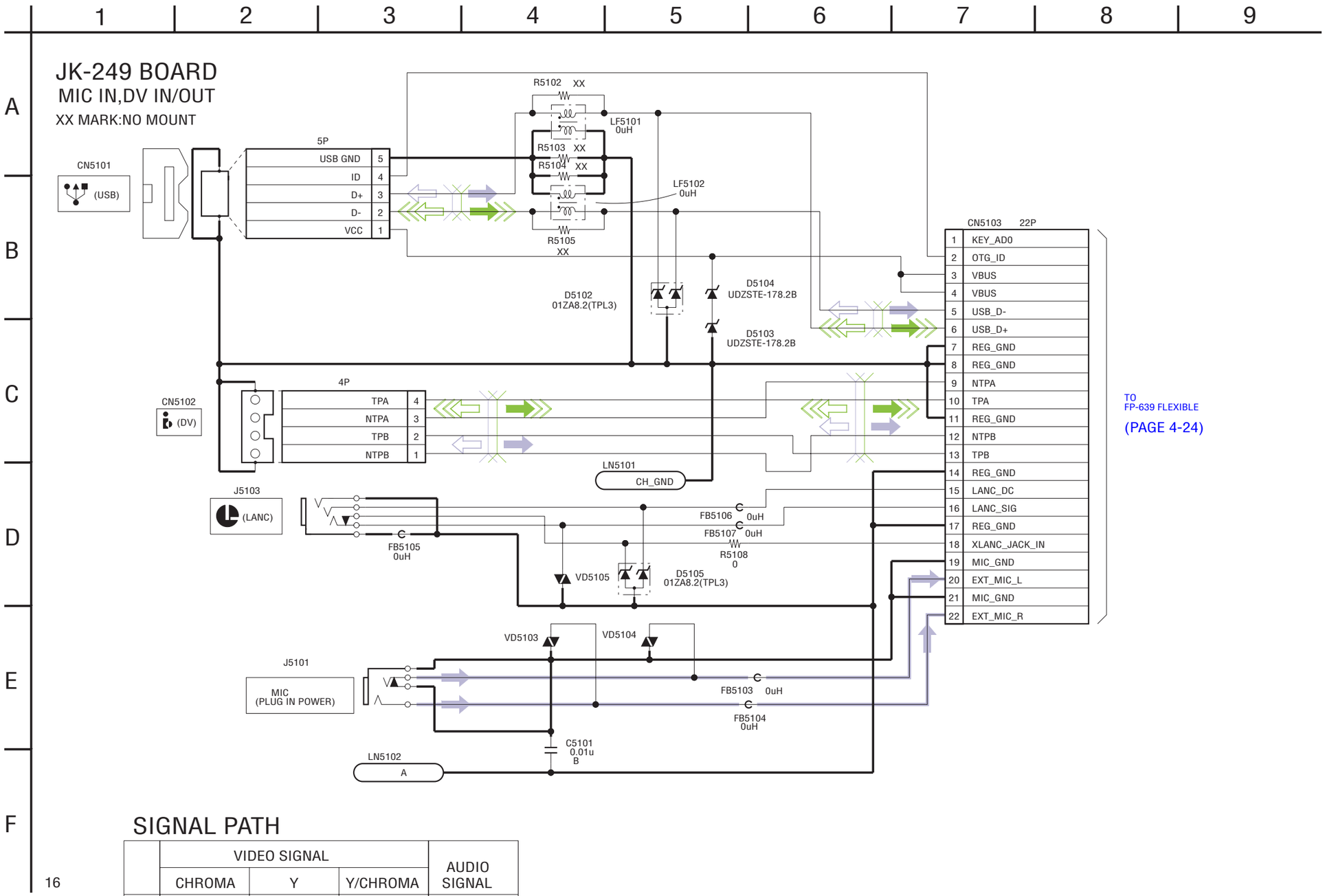


SIGNAL PATH

	VIDEO SIGNAL			AUDIO SIGNAL
	CHROMA	Y	Y/CHROMA	
REC	→	→	→	→
PB	⇨	⇨	⇨	⇨

For Schematic Diagram

• Refer to page 4-81 for printed wiring board.

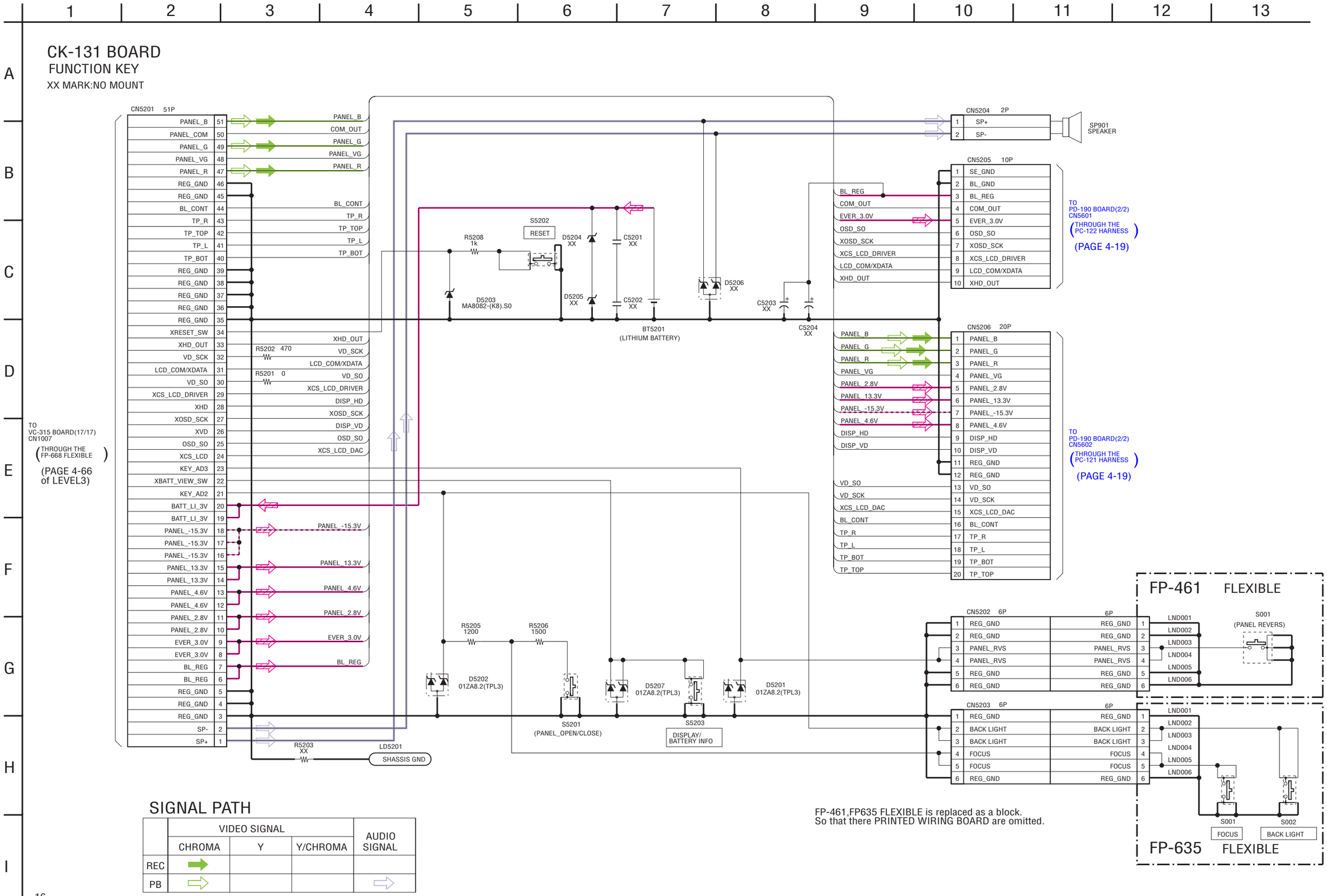


SIGNAL PATH

	VIDEO SIGNAL			AUDIO SIGNAL
	CHROMA	Y	Y/CHROMA	
REC			➡	➡
PB			⇨	⇨

For Schematic Diagram

• Refer to page 4-83 for printed wiring board.



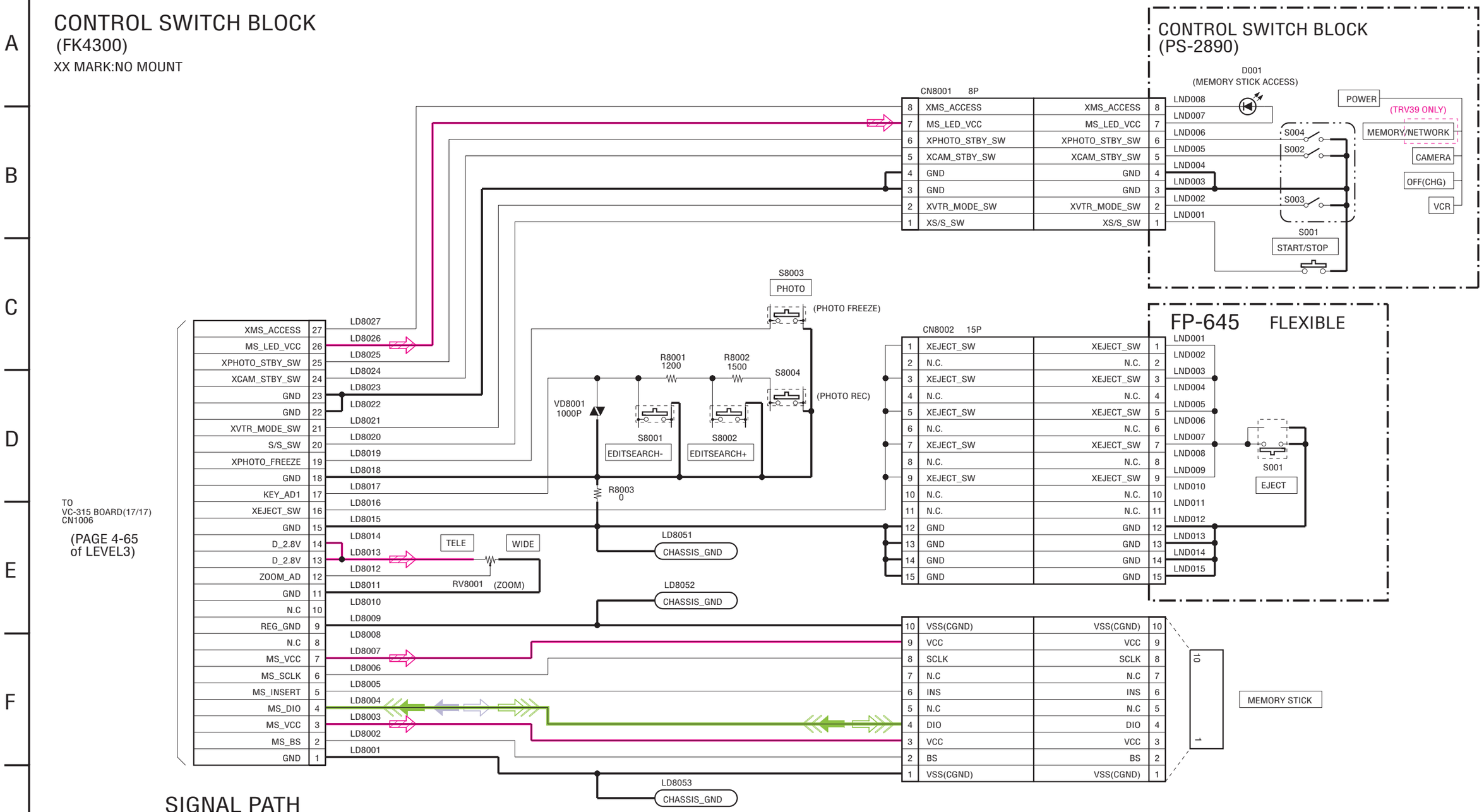
FP-461,FP635 FLEXIBLE is replaced as a block.
So that there PRINTED WIRING BOARD are omitted.

SIGNAL PATH

	VIDEO SIGNAL			AUDIO SIGNAL
	CHROMA	Y	Y/CHROMA	
REC	➡			
PB	⇨			⇨

CONTROL SWITCH BLOCK
(FK4300)

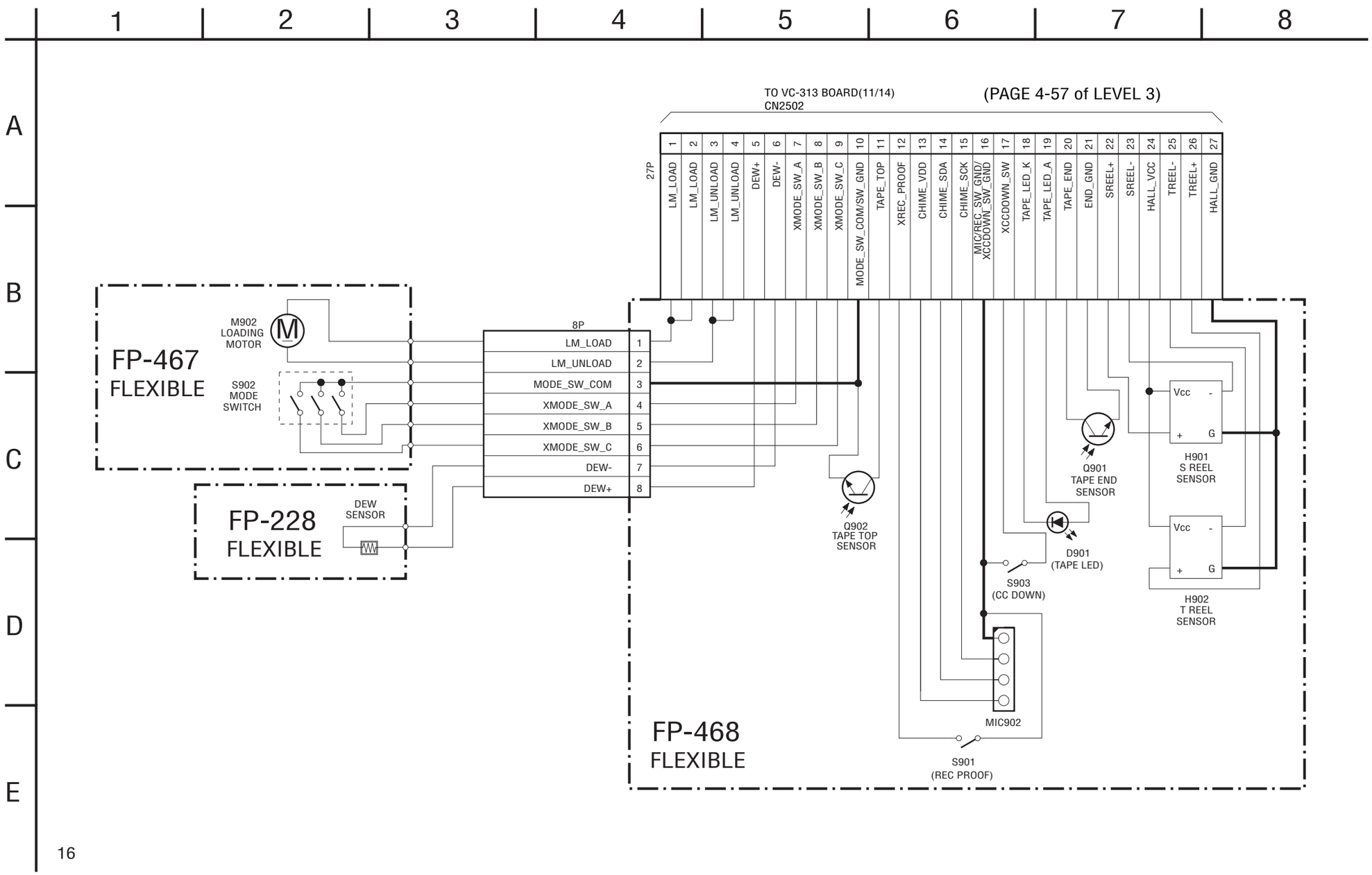
XX MARK:NO MOUNT



SIGNAL PATH

	VIDEO SIGNAL			AUDIO SIGNAL
	CHROMA	Y	Y/CHROMA	
REC			⇛	⇒
PB			⇛	⇒

CONTROL SWITCH BLOCK(FK4300,PS-2890),FP-645 FLEXIBLE
is replaced as a block.
So that these PRINTED WIRING BOARD is omitted.



Schematic diagram of the VC-315 board are not shown.
Pages from 4-33 to 4-66 are not shown.

COVER

4-3. PRINTED WIRING BOARDS

Link

CD-436 BOARD	MA-423 BOARD
LB-087 (-11) BOARD/LB-087 (-12) BOARD	JK-248 BOARD
DI-089 BOARD (SIDE A)	JK-249 BOARD
DI-089 BOARD (SIDE B)	CK-131 BOARD
PD-190 BOARD	FP-467/FP-468/FP-228 BOARD

COMMON NOTE FOR PRINTED WIRING BOARDS		WAVEFORMS
MOUNTED PARTS LOCATION	CIRCUIT BOARDS LOCATION	FLEXIBLE BOARDS LOCATION

COVER

4-3. PRINTED WIRING BOARDS

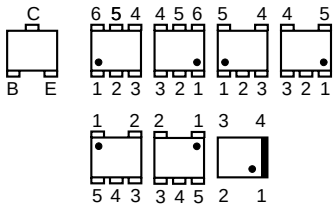
THIS NOTE IS COMMON FOR WIRING BOARDS
(In addition to this, the necessary note is printed in each block)

(For printed wiring boards)

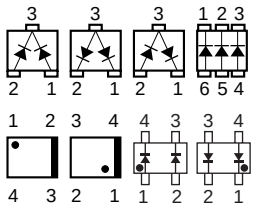
- : Uses unleaded solder.
- : Pattern from the side which enables seeing. (The other layers' patterns are not indicated)
- Through hole is omitted.
- Circled numbers refer to waveforms.
- There are a few cases that the part printed on diagram isn't mounted in this model.
- : panel designation

- Chip parts.

Transistor



Diode



BOARD INFORMATION

board name	parts location (shown on page)	waveform (shown on page)	pattern		CSP IC
			number of layers	layers not shown	
CD-436	4-101	4-95	2	–	–
LB-087	–	–	8	2 to 7	–
DI-089	–	4-95	6	2 to 5	–
PD-190	4-101	4-96	2	2	–
MA-423	4-101	–	2	–	–
JK-248	4-101	–	2	–	–
FP-639 FLEXIBLE	–	–	–	–	–
JK-249	4-100	–	2	–	–
CK-131	4-100	–	2	–	–
VC-315	4-101	4-97	8	2 to 7	IC1601,IC1602, IC2101, IC2201, IC2301, IC2601, IC2704, IC2802, IC2803, IC3001, IC3102, IC3302

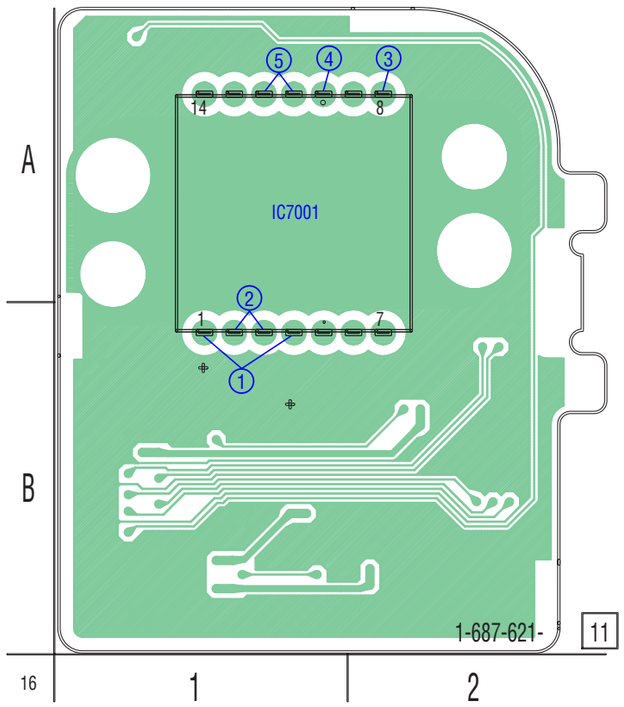
4-3. PRINTED WIRING BOARDS

CD-436 (CCD IMAGER) PRINTED WIRING BOARD
LB-087 (EVF, BACKLIGHT) PRINTED WIRING BOARD

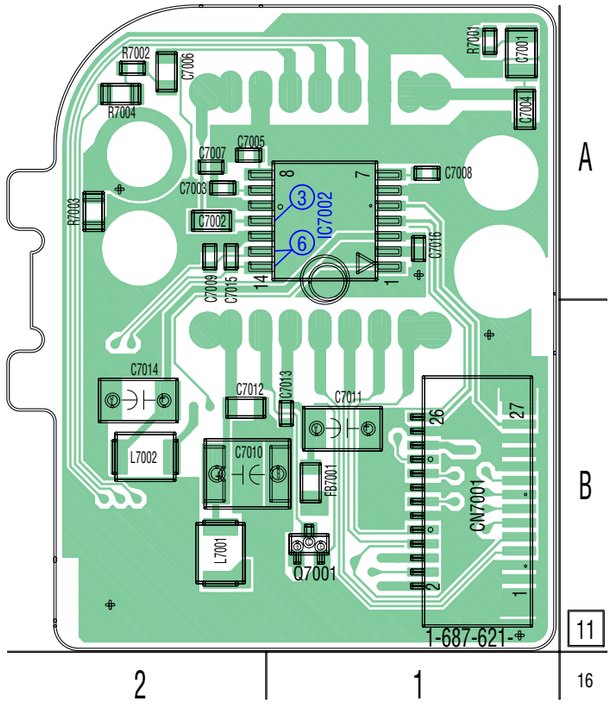
• Refer to page 4-67 for common note for printed wiring board.

• : Uses unleaded solder.

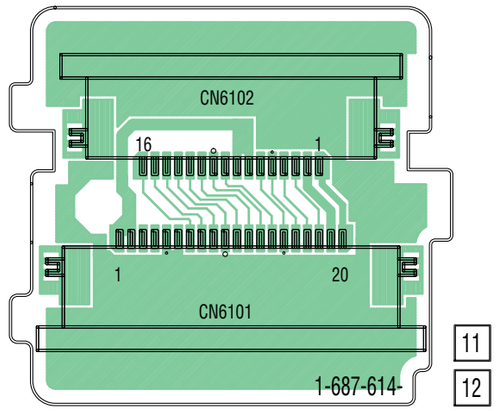
CD-436 BOARD
(SIDE A)



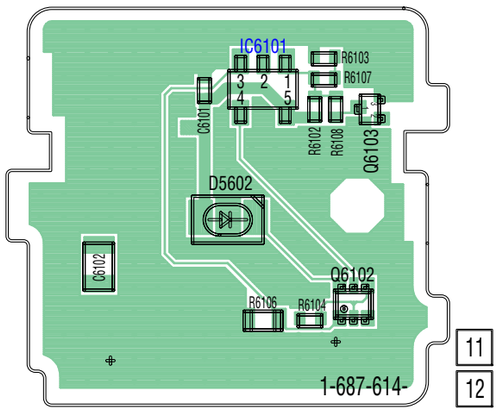
CD-436 BOARD
(SIDE B)



LB-087 BOARD
(SIDE A)



LB-087 BOARD
(SIDE B)

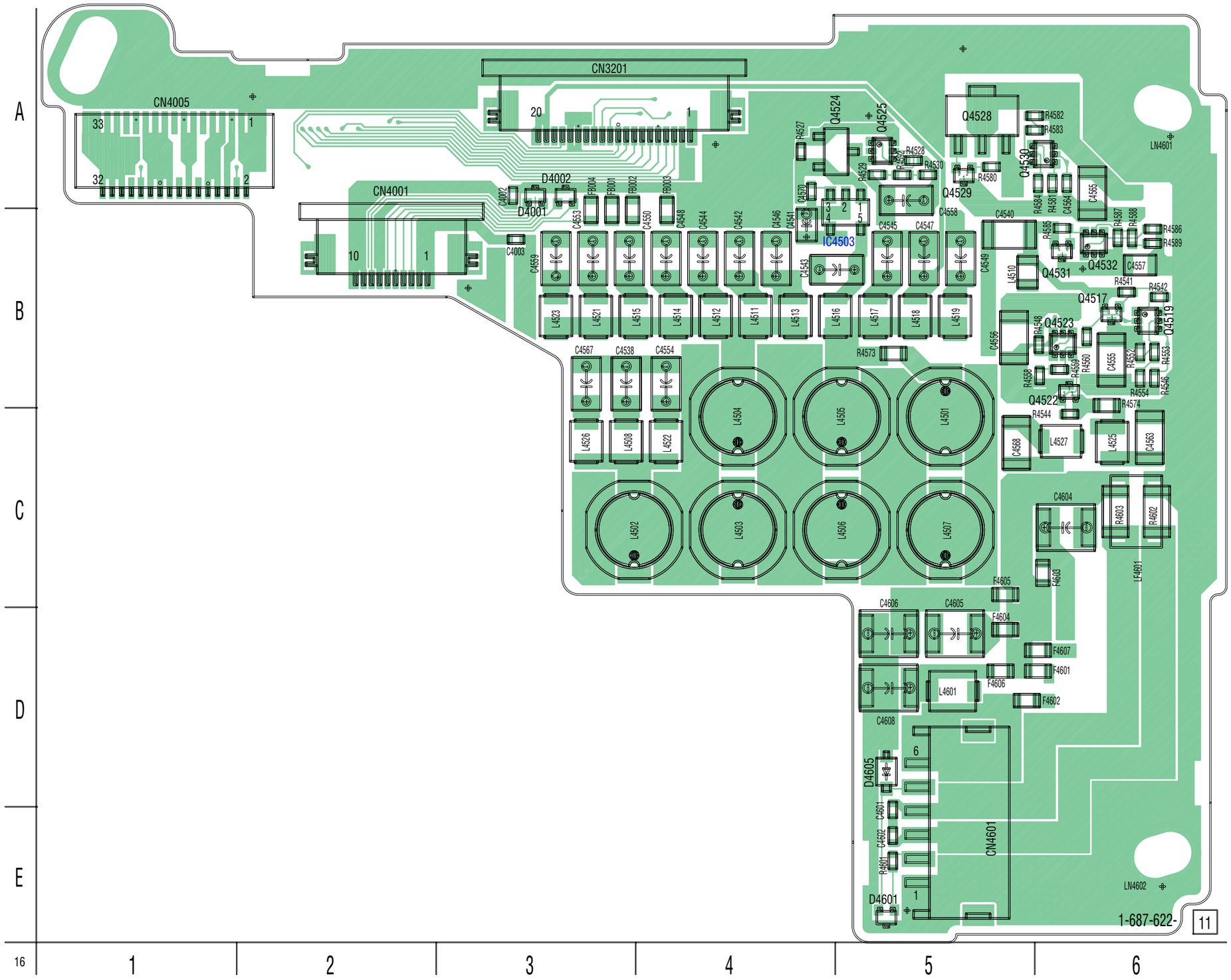


DI-089 (CHARGE, POWER IN, EVF DRIVE, TIMING GEN., DC/DC CONVERTER) PRINTED WIRING BOARD

• Refer to page 4-67 for common note for printed wiring board.

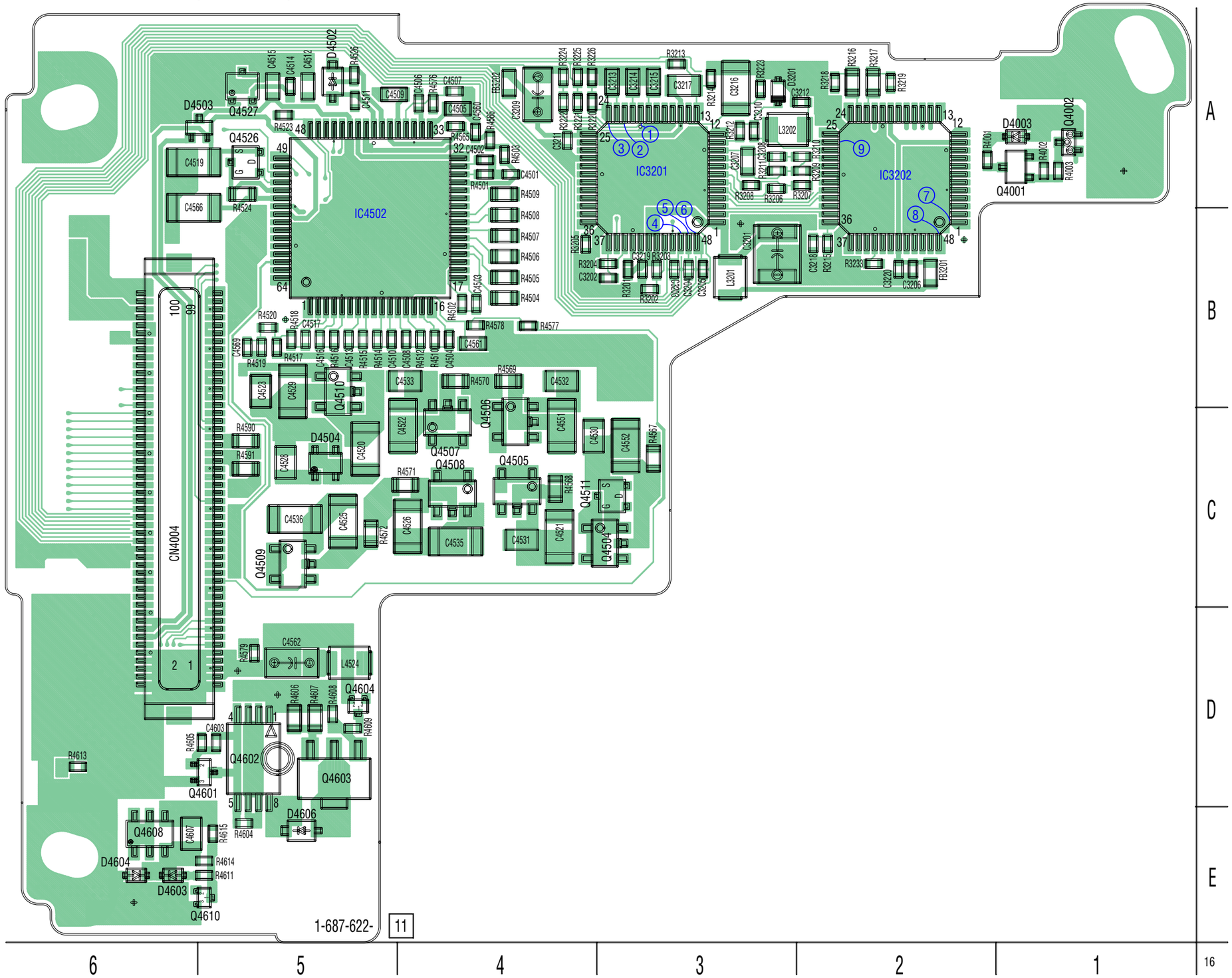
• : Uses unleaded solder.

DI-089 BOARD(SIDE A)



- : Uses unleaded solder.

DI-089 BOARD(SIDE B)

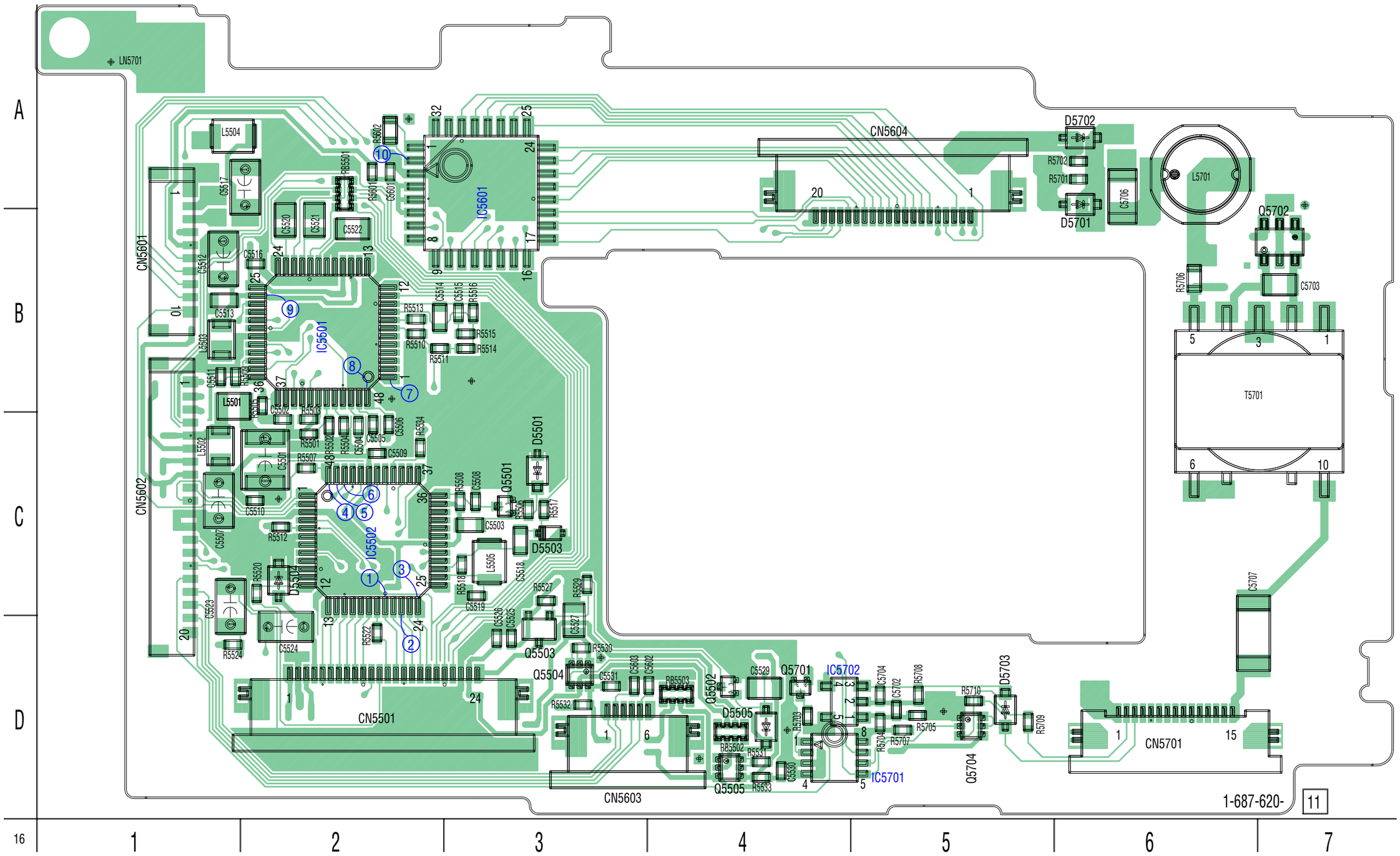


PD-190 (LCD DRIVER, TIMING GEN., LCD BACKLIGHT) PRINTED WIRING BOARD

• Refer to page 4-67 for common note for printed wiring board.

• : Uses unleaded solder.

PD-190 BOARD

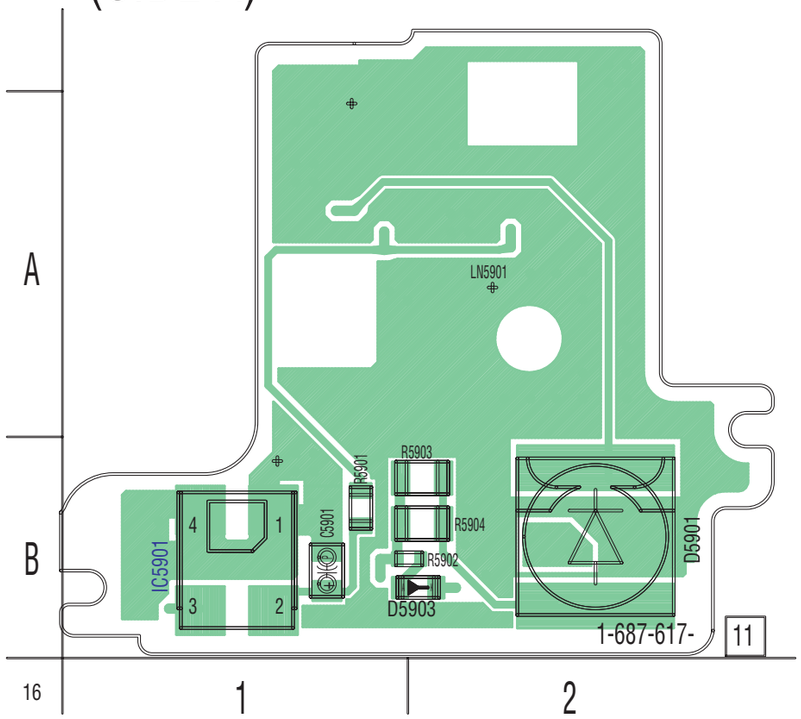


MA-423 (MIC IN, REMOCON REC) PRINTED WIRING BOARD

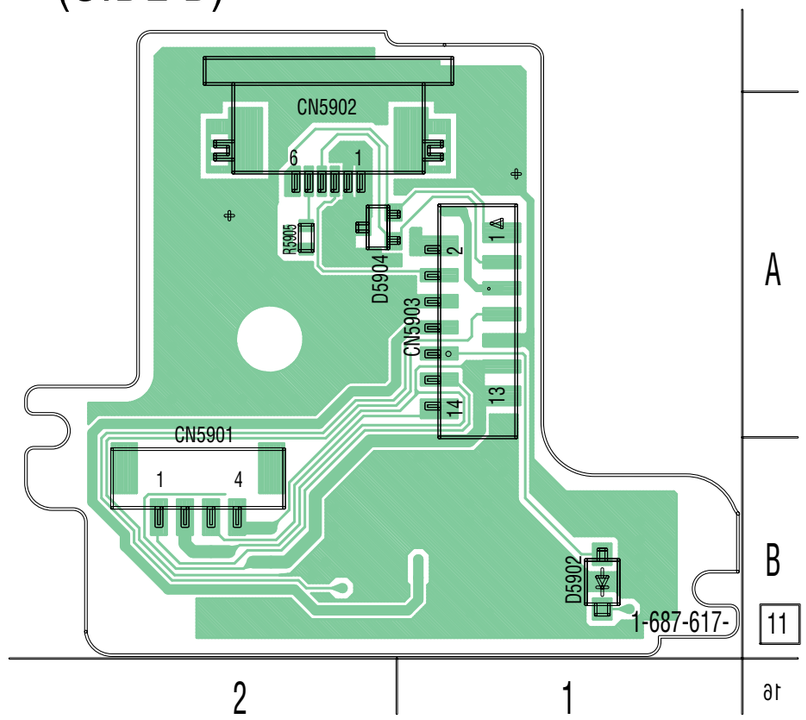
• Refer to page 4-67 for common note for printed wiring board.

• : Uses unleaded solder.

MA-423 BOARD (SIDE A)



MA-423 BOARD (SIDE B)

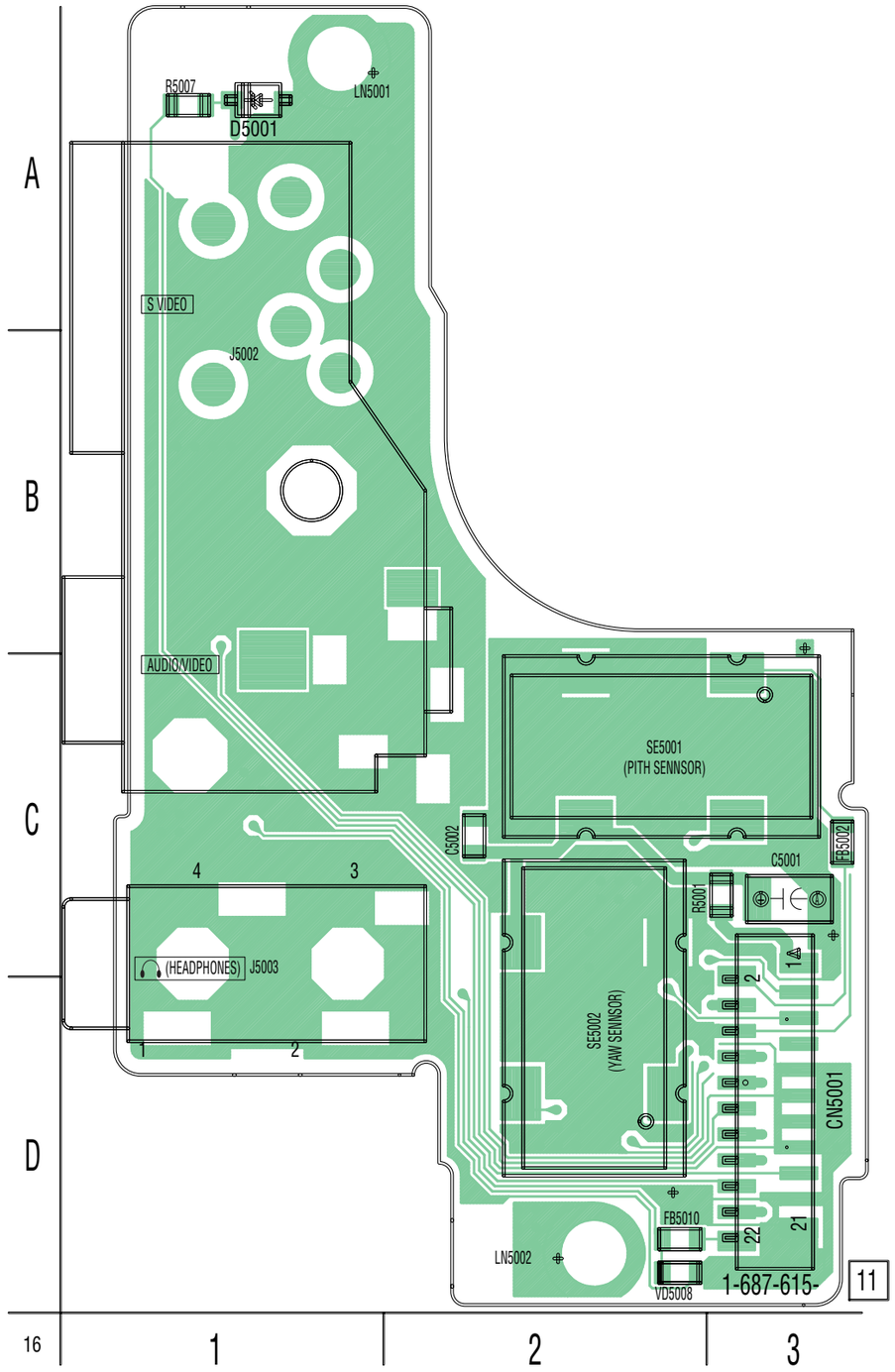


JK-248 (P/Y SENSOR, A/V-IN) PRINTED WIRING BOARD

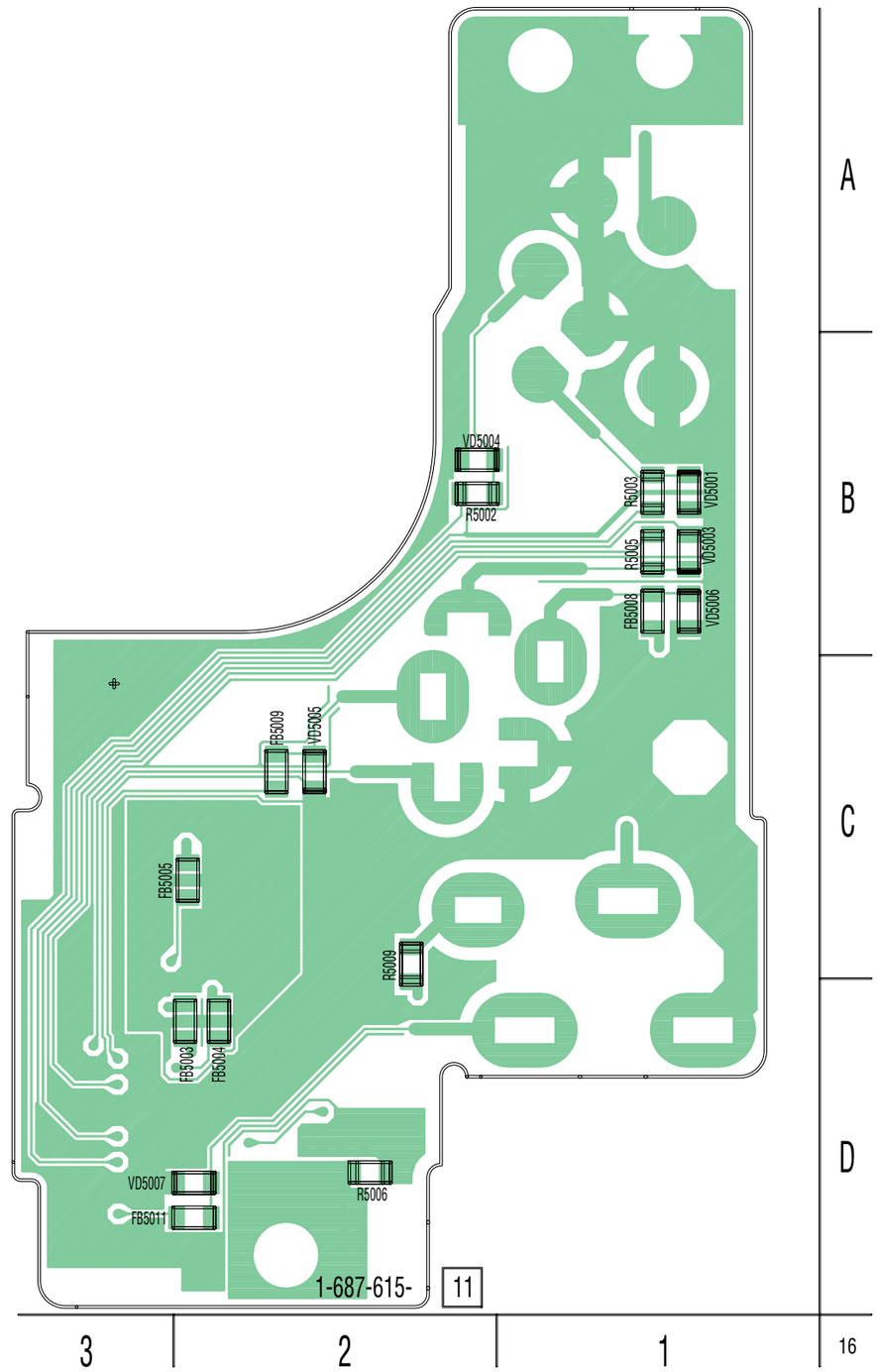
• Refer to page 4-67 for common note for printed wiring board.

• : Uses unleaded solder.

JK-248 BOARD(SIDE A)



JK-248 BOARD(SIDE B)

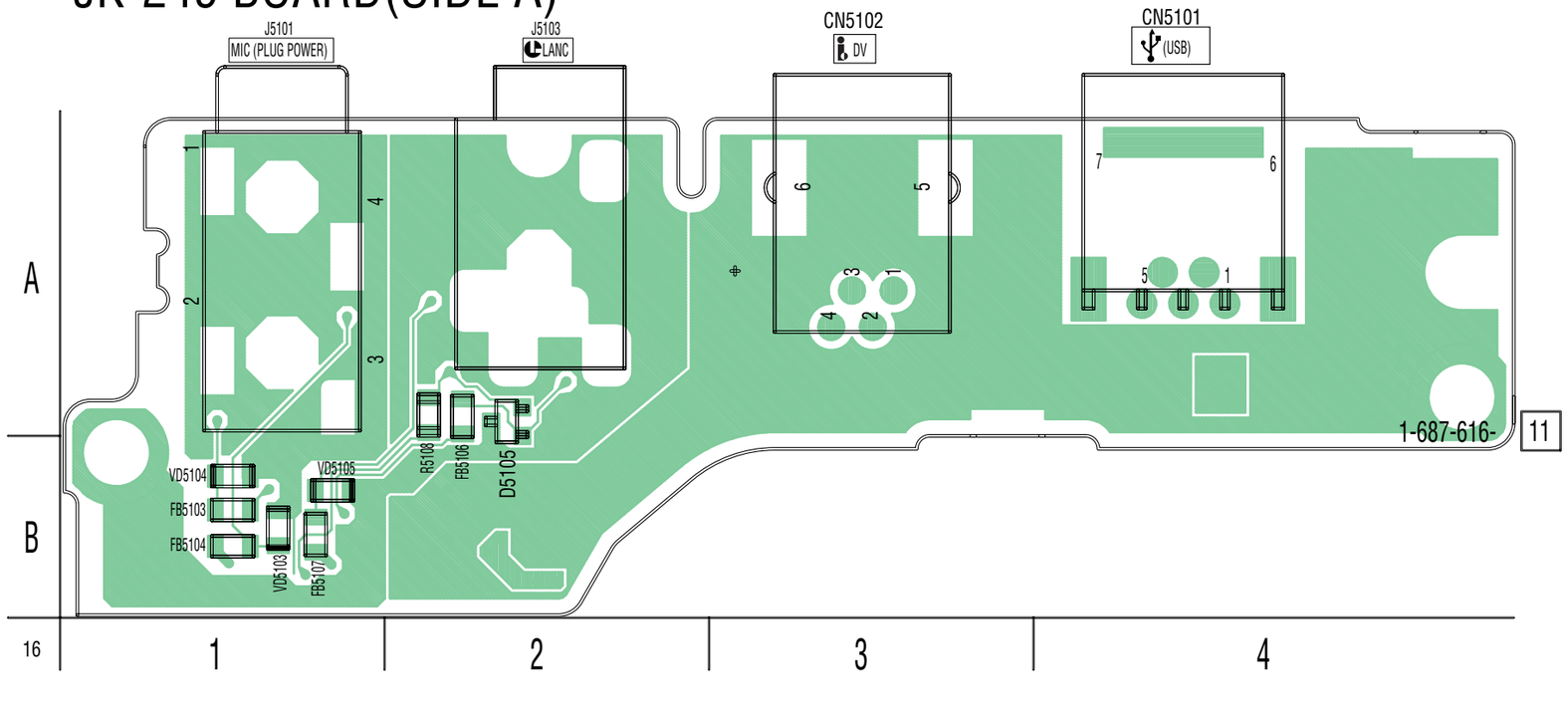


JK-249 (MIC IN, DV IN/OUT) PRINTED WIRING BOARD

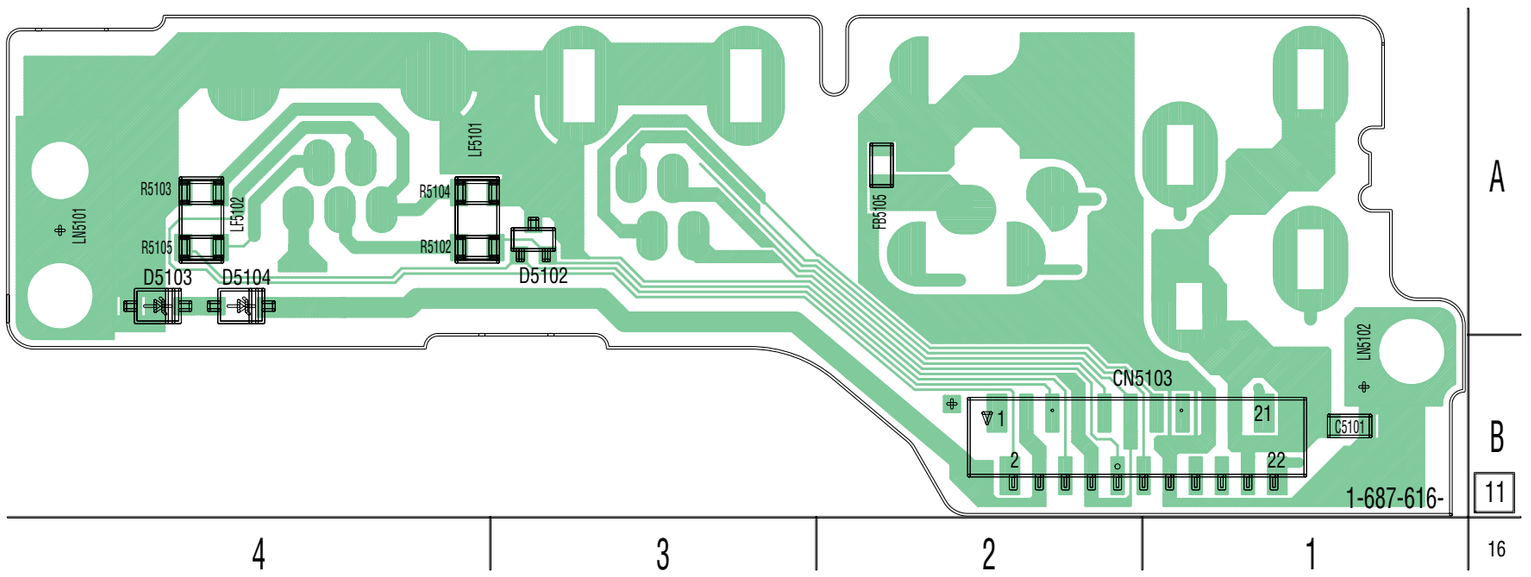
• Refer to page 4-67 for common note for printed wiring board.

• : Uses unleaded solder.

JK-249 BOARD(SIDE A)



JK-249 BOARD(SIDE B)

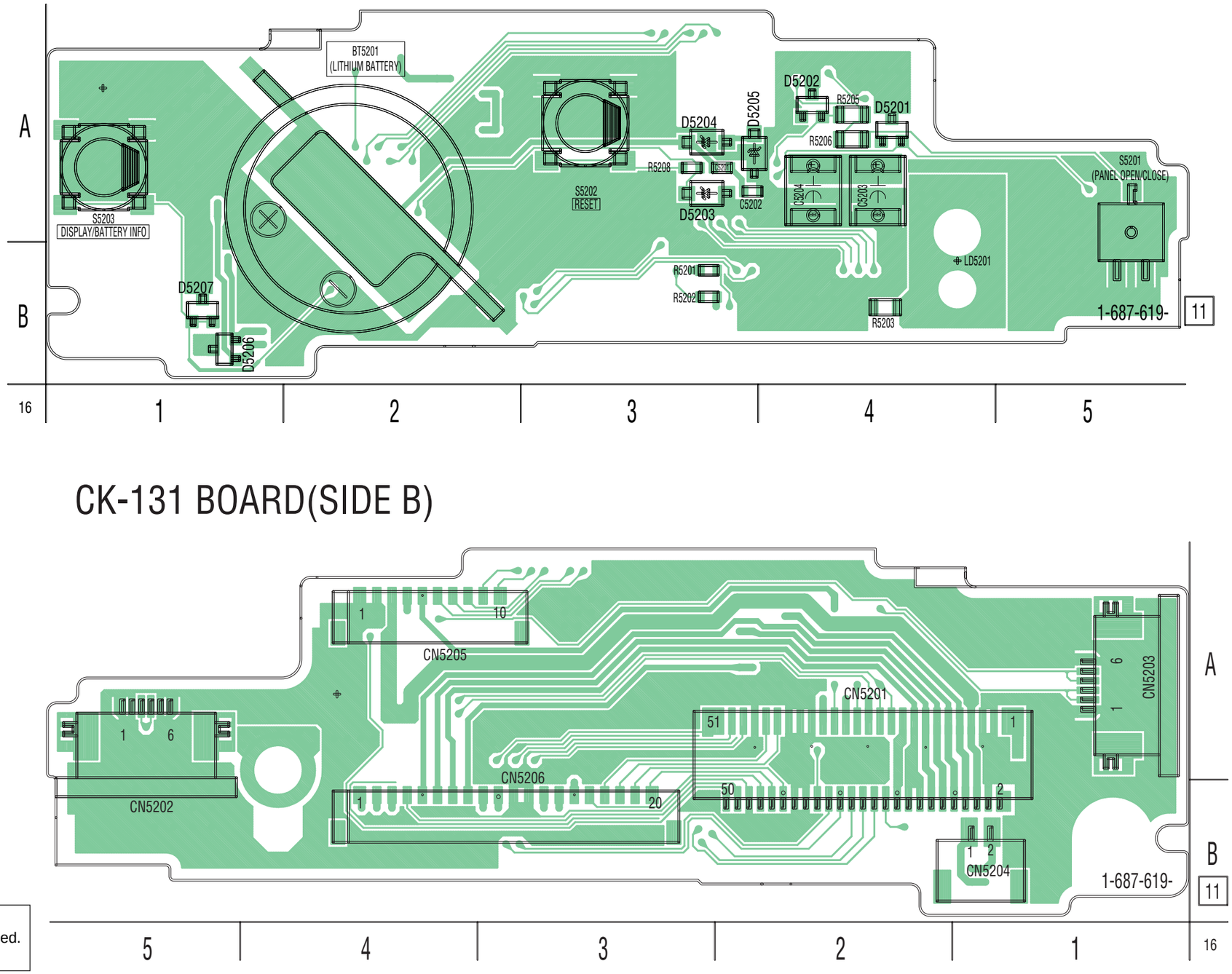


CK-131 (FUNCTION KEY) PRINTED WIRING BOARD

• Refer to page 4-67 for common note for printed wiring board.

• : Uses unleaded solder.

CK-131 BOARD(SIDE A)



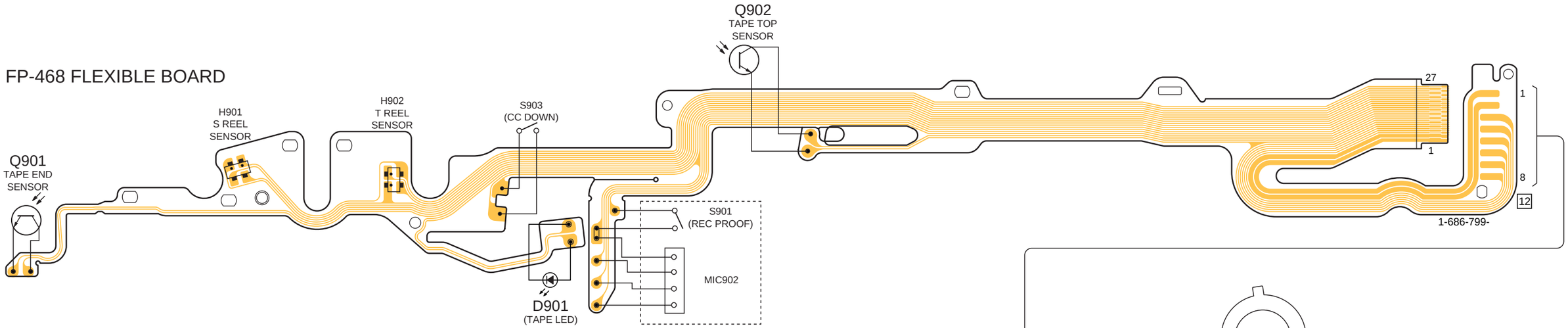
CK-131 BOARD(SIDE B)

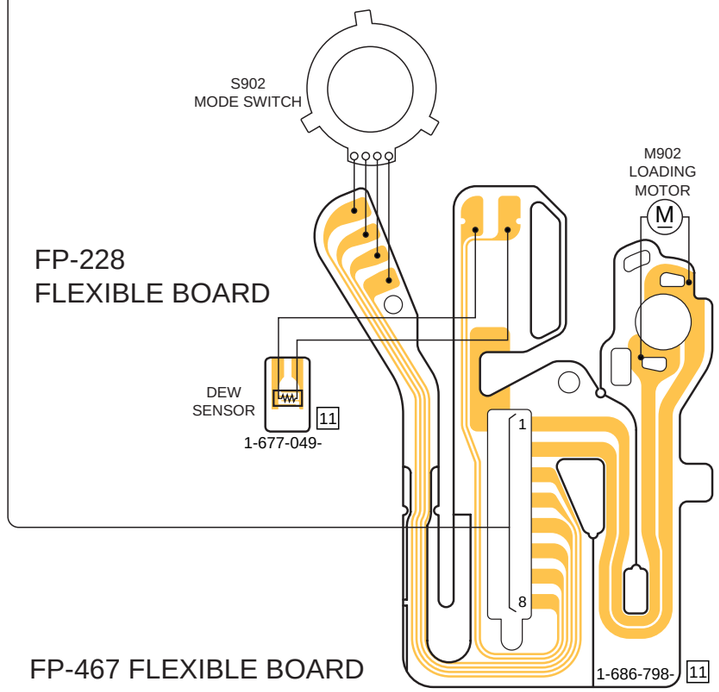
CAUTION :
Danger of explosion if battery is incorrectly replaced.
Replace only with the same or equivalent type.

FP-467/468/228 FLEXIBLE WIRING BOARD (MD BLOCK)

• Refer to page 4-67 for common note for printed wiring board.

• : Uses unleaded solder.



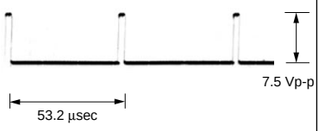


Printed wiring board of the VC-315 board are not shown.
Pages from 4-87 to 4-94 are not shown.

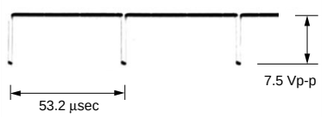
4-4. WAVEFORMS

CD-436 BOARD CAMERA REC

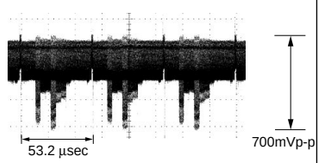
① IC7001 ①,④



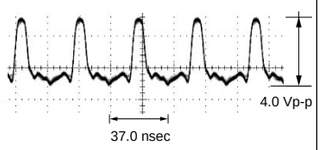
② IC7001 ②,③



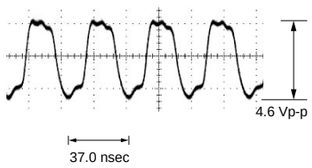
③ IC7001 ⑧,IC7002 ⑪



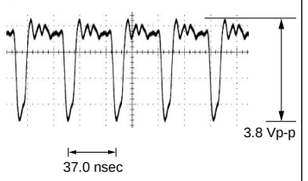
④ IC7001 ⑩



⑤ IC7001 ⑪,⑫

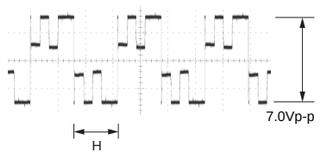


⑥ IC7002 ⑬,⑭

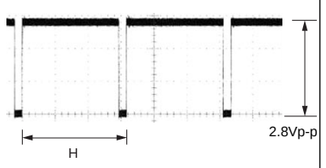


DI-089 BOARD

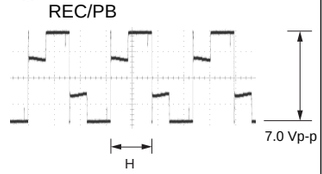
① IC3201 ⑳ REC/PB



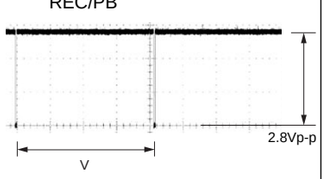
⑦ IC3202 ① REC/PB



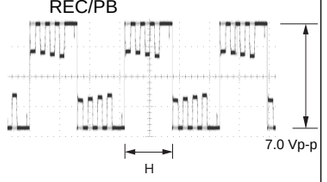
② IC3201 ㉒ REC/PB



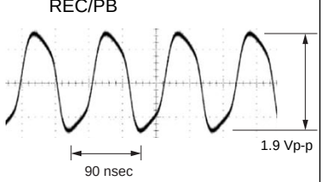
⑧ IC3202 ㊽ REC/PB



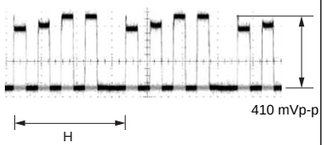
③ IC3201 ㉔ REC/PB



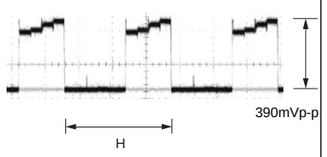
⑨ IC3202 ㉖ REC/PB



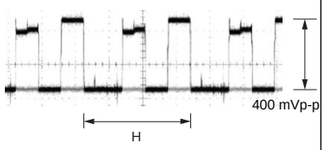
④ IC3201 ㊻ REC/PB



⑤ IC3201 ㊼ REC/PB

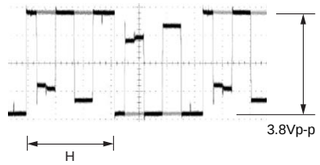


⑥ IC3201 ㊽ REC/PB

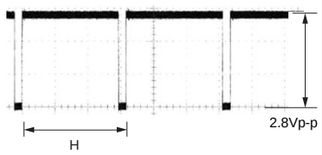


PD-190 BOARD REC/PB

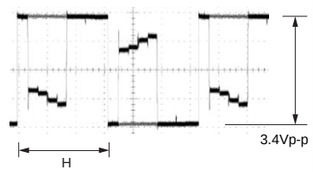
① IC5501 ⑳



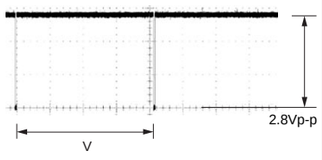
⑦ IC5502 ①



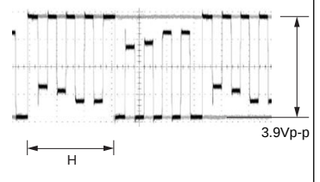
② IC5501 ㉒



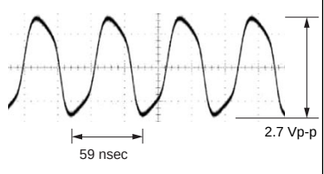
⑧ IC5502 ㊽



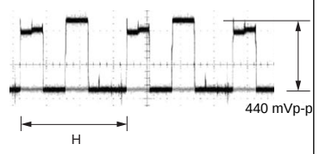
③ IC5501 ㉔



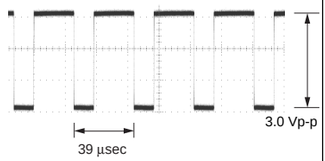
⑨ IC5502 ㉖



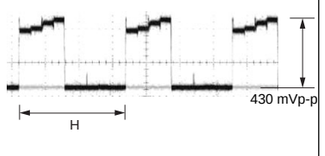
④ IC5501 ㊽



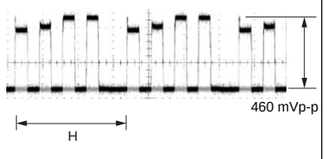
⑩ IC5601 ②



⑤ IC5501 ㊼



⑥ IC5501 ㊻



Waveforms of the VC-315 board are not shown.
Pages from 4-97 to 4-98 is not shown.

COVER

4-5. MOUNTED PARTS LOCATION

no mark : side A
* mark : side B

CD-436 BOARD

*	C7001	A-1
*	C7002	A-2
*	C7003	A-2
*	C7004	A-2
*	C7005	A-2
*	C7006	A-2
*	C7007	A-2
*	C7008	A-2
*	C7009	A-2
*	C7010	B-2
*	C7011	B-1
*	C7012	B-2
*	C7013	B-1
*	C7014	B-2
*	C7015	A-2
*	C7016	A-2
*	CN7001	B-1
*	FB7001	B-1
	IC7001	A-1
*	IC7002	A-2
*	L7001	B-2
*	L7002	B-2
*	Q7001	B-1
*	R7001	A-2
*	R7002	A-2
*	R7003	A-2
*	R7004	A-2

PD-190 BOARD

	C5501	C-2
	C5502	C-2
	C5503	C-3
	C5504	C-2
	C5505	C-2
	C5506	C-2
	C5507	C-1
	C5508	C-3
	C5509	C-2
	C5510	C-2
	C5511	B-1
	C5512	B-1
	C5513	B-1
	C5514	B-2
	C5515	B-3
	C5516	B-2
	C5517	A-1
	C5518	C-3
	C5519	C-3
	C5520	B-2
	C5521	B-2
	C5522	B-2
	C5523	C-1
	C5524	D-2
	C5525	D-3
	C5526	D-3
	C5527	D-3
	C5529	D-4
	C5530	D-4
	C5531	D-3
	C5601	A-2
	C5602	D-4
	C5603	D-3
	C5702	D-5
	C5703	B-7
	C5704	D-5
	C5706	A-6
	C5707	D-6
	CN5501	D-2
	CN5601	B-1
	CN5602	C-1
	CN5603	D-3
	CN5604	A-5
	CN5701	D-6
	D5501	C-3
	D5504	C-2
	D5505	D-4
	D5701	A-6
	D5702	A-6
	D5703	D-5
	IC5501	B-2
	IC5502	C-2
	IC5601	A-3
	IC5701	D-4
	IC5702	D-4
	L5501	B-1
	L5502	C-1
	L5503	B-1
	L5504	A-1
	L5505	C-3
	L5701	A-6
	Q5501	C-3
	Q5502	D-4
	Q5503	D-3
	Q5504	D-3
	Q5505	D-4
	Q5701	D-4
	Q5702	B-7
	Q5703	B-7
	Q5704	D-5
	R5502	C-2
	R5503	C-2
	R5504	C-2
	R5505	B-2
	R5506	C-3
	R5508	C-3
	R5509	B-1
	R5510	B-2
	R5511	B-2
	R5512	C-2
	R5513	B-2
	R5514	B-3
	R5515	B-3
	R5516	B-3
	R5517	C-3
	R5518	C-3
	R5520	C-2
	R5522	D-2
	R5524	D-1
	R5527	C-3
	R5529	C-3
	R5530	D-3
	R5531	D-4
	R5532	D-3
	R5533	D-4
	R5534	C-2
	R5601	A-2
	R5602	A-2
	R5701	A-6
	R5702	A-6
	R5703	D-4
	R5704	D-5
	R5705	D-5
	R5706	B-6
	R5707	D-5
	R5708	D-5
	R5709	D-5
	R5710	D-5
	RB5501	A-2
	RB5502	D-4
	RB5503	D-4
	T5701	B-6

MA-423 BOARD

	C5901	B-1
*	CN5901	B-2
*	CN5902	A-2
*	CN5903	A-1
	D5901	B-2
*	D5902	B-1
	D5903	B-2
*	D5904	A-2
	IC5901	B-1
	R5901	B-1
	R5902	B-2
	R5903	B-2
	R5904	B-2
*	R5905	A-2

JK-248 BOARD

	C5001	C-3
	C5002	C-2
	CN5001	D-3
	D5001	A-1
	FB5002	C-3
*	FB5003	D-2
*	FB5004	D-2
*	FB5005	C-2
*	FB5008	B-1
*	FB5009	C-2
	FB5010	D-2
*	FB5011	D-2
	J5002	B-1
	J5003	C-1
	R5001	C-3
*	R5002	B-2
*	R5003	B-1
*	R5005	B-1
*	R5006	D-2
	R5007	A-1
*	R5009	C-2
	SE5001	C-2
	SE5002	D-2
*	VD5001	B-1
*	VD5003	B-1
*	VD5004	B-2
*	VD5005	C-2
*	VD5006	B-1
*	VD5007	D-2
	VD5008	D-2

COVER

4-3. PRINTED WIRING BOARDS

no mark : side A
* mark : side B

JK-249 BOARD

*	C5101	B-1
	CN5101	A-3
	CN5102	A-2
*	CN5103	B-1
*	D5102	A-3
*	D5103	A-3
*	D5104	A-3
	D5105	A-2
	FB5103	B-1
	FB5104	B-1
*	FB5105	A-2
	FB5106	A-2
	FB5107	B-1
	J5101	A-1
	J5103	A-2
*	LF5101	A-3
*	LF5102	A-3
*	R5102	A-3
*	R5103	A-3
*	R5104	A-3
*	R5105	A-3
	R5108	A-2
	VD5103	B-1
	VD5104	B-1
	VD5105	B-1

CK-131 BOARD

	BT5201	A-2
	C5201	A-3
	C5202	A-3
	C5203	A-4
	C5204	A-4
*	CN5201	A-2
*	CN5202	A-5
*	CN5203	A-1
*	CN5204	B-1
*	CN5205	A-4
*	CN5206	B-3
	D5201	A-4
	D5202	A-4
	D5203	A-3
	D5204	A-3
	D5205	A-3
	D5206	B-1
	D5207	B-1
	R5201	B-2
	R5202	B-2
	R5203	B-3
	R5205	A-4
	R5206	A-4
	R5208	A-3
	S5201	A-5
	S5202	A-3
	S5203	A-1

Mounted parts location of the VC-315 board is not shown.
Pages from 4-101 to 4-102 is not shown.

COVER

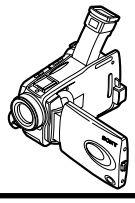
NOTE

5. REPAIR PARTS LIST

NOTE: Characters A to Z of the electrical parts list indicate location of exploded views in which the desired part is shown.

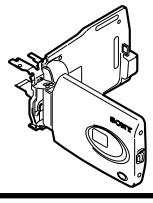
Link

EXPLODED VIEWS



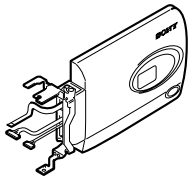
A

OVERALL



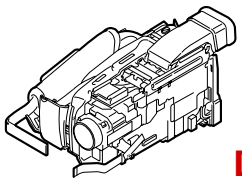
B

CABINET (R) SECTION



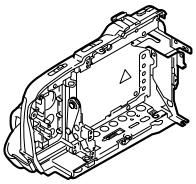
C

PANEL BLOCK SECTION

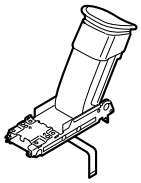


D

CABINET (L) SECTION-1

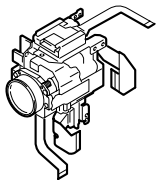


CABINET (L) SECTION-2



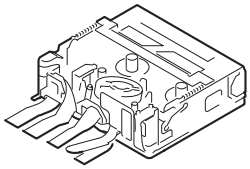
E

EVF SECTION

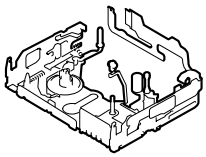


F

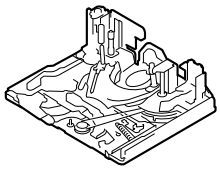
LENS SECTION



OVERALL (MECHANISM DECK-Z100)



LS CHASSIS BLOCK ASSEMBLY



MECHANICAL CHASSIS BLOCK ASSEMBLY

Link

ELECTRICAL PARTS LIST

ACCESSORIES

CD-436 BOARD F	FP-645 BOARD D	MA-423 BOARD A
CK-131 BOARD B	JK-248 BOARD F	PD-190 BOARD C
DI-089 BOARD D	JK-249 BOARD F	SE-136 BOARD B
FP-635 BOARD B	LB-087 BOARD E	VC-315 BOARD D

COVER

5. REPAIR PARTS LIST

NOTE:

- -XX, -X mean standardized parts, so they may have some differences from the original one.
- Items marked "*" are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.
- The mechanical parts with no reference number in the exploded views are not supplied.
- Due to standardization, replacements in the parts list may be different from the parts specified in the diagrams or the components used on the set.
- CAPACITORS:
  uF: µF
- COILS
  uH: µH
- RESISTORS
  All resistors are in ohms.
  METAL: metal-film resistor
  METAL OXIDE: Metal Oxide-film resistor
  F: nonflammable
- SEMICONDUCTORS
  In each case, u: µ, for example:
  uA...: µA... , uPA... , µPA... ,
  uPB... , µPB... , uPC... , µPC... ,
  uPD..., µPD...
- Abbreviation
  CND : Canadian model
  JE : Tourist model
  CH : Chinese model
  KR : Korea model
  HK : Hong Kong model

When indicating parts by reference number, please include the board name.

The components identified by mark or dotted line with mark are critical for safety.
Replace only with part number specified.

Les composants identifiés par une marque sont critiques pour la sécurité.
Ne les remplacer que par une pièce portant le numéro spécifié.

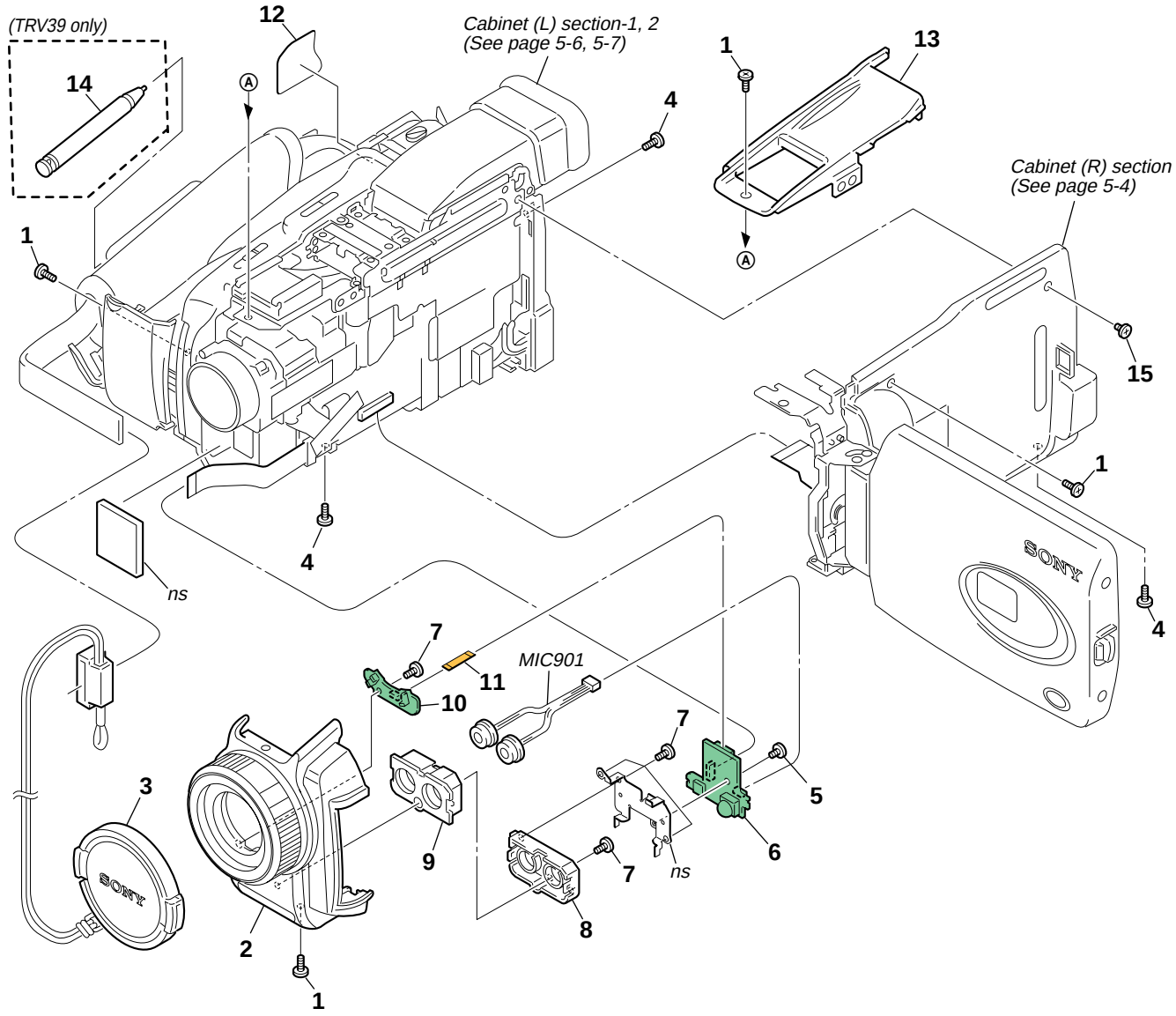
COVER

5. REPAIR PARTS LIST

5-1. EXPLODED VIEWS

5-1-1. OVERALL

ns : not supplied



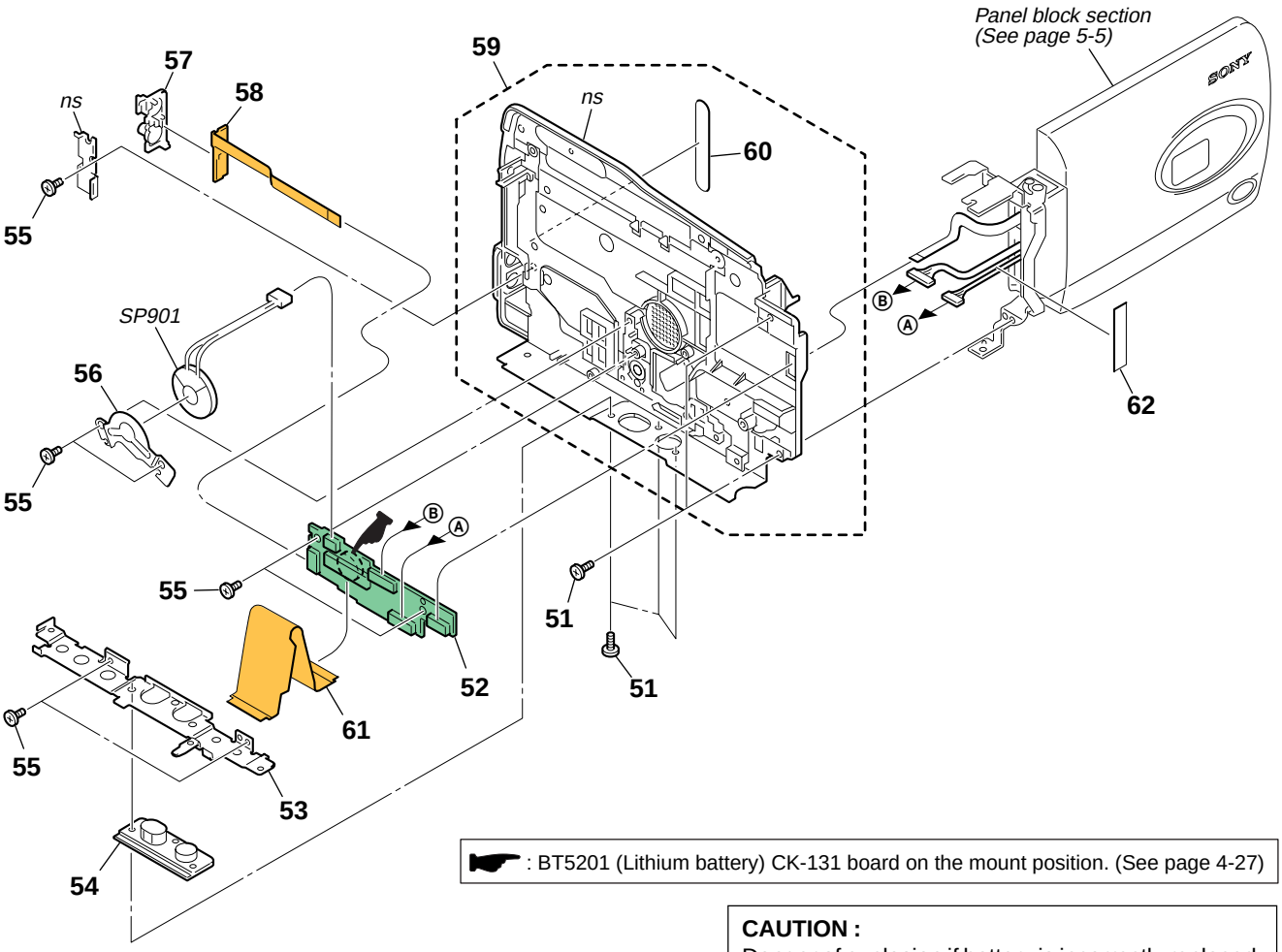
Ref. No.	Part No.	Description
1	3-989-735-31	SCREW (M1.7), LOCK ACE, P2
2	X-3953-147-1	PANEL ASSY, FRONT
3	X-3950-537-1	CAP ASSY, LENS
4	3-080-198-31	SCREW(M1.7),LOCK ACE,P2
5	3-078-889-11	SCREW (M1.7)
6	A-7078-560-A	MA-423 BOARD, COMPLETE
7	3-078-890-01	SCREW, TAPPING
8	3-080-814-02	RETAINER, MICROPHONE
9	3-080-813-01	HOLDER, MICROPHONE
10	A-7078-561-A	SE-136 BOARD, COMPLETE
11	1-687-661-11	FP-642 FLEXIBLE BOARD
12	3-073-502-21	SHEET, POWER (TRV39)
12	3-073-502-31	SHEET, POWER (TRV38/TRV38E)
13	X-3953-166-1	CABINET ASSY, TOP
14	3-073-941-01	STYLUS (S) (TRV39)
15	3-989-735-11	SCREW (M1.7), LOCK ACE, P2
MIC901	1-542-477-11	MICROPHONE

COVER

5. REPAIR PARTS LIST

5-1-2. CABINET (R) SECTION

ns : not supplied



: BT5201 (Lithium battery) CK-131 board on the mount position. (See page 4-27)

CAUTION :
Danger of explosion if battery is incorrectly replaced.
Replace only with the same or equivalent type.

Ref. No.	Part No.	Description
51	3-055-573-21	SCREW (M1.7), LOCK ACE, P2
52	A-7078-562-A	CK-131 BOARD, COMPLETE
53	3-080-825-01	FRAME, BOTTOM
54	3-055-257-11	TRIPOD (LARGE)
55	3-078-890-01	SCREW, TAPPING
* 56	X-3950-471-1	RETAINER ASSY, SPEAKER
57	3-080-823-01	BUTTON, F&B

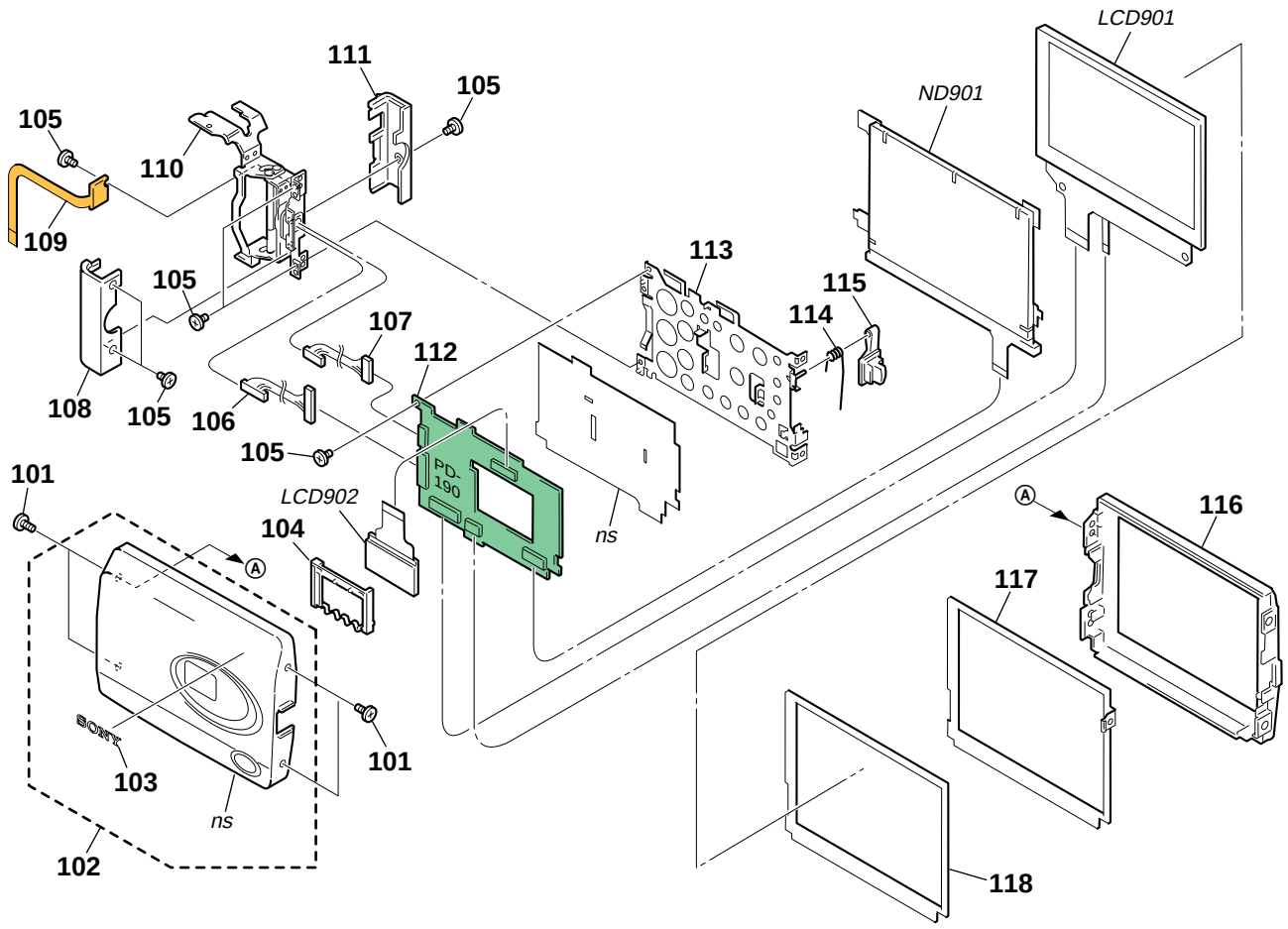
Ref. No.	Part No.	Description
58	A-7078-581-A	FP-635 BOARD, COMPLETE
59	X-3953-139-2	CABINET (R) ASSY
60	3-080-821-01	CUSHION, PANEL
61	1-687-663-11	FP-668 FLEXIBLE BOARD
62	3-083-977-01	TAPE, P HARNESS BINDING
SP901	1-825-260-21	LOUD SPEAKER (1.6CM)

COVER

5. REPAIR PARTS LIST

5-1-3. PANEL BLOCK SECTION

ns : not supplied



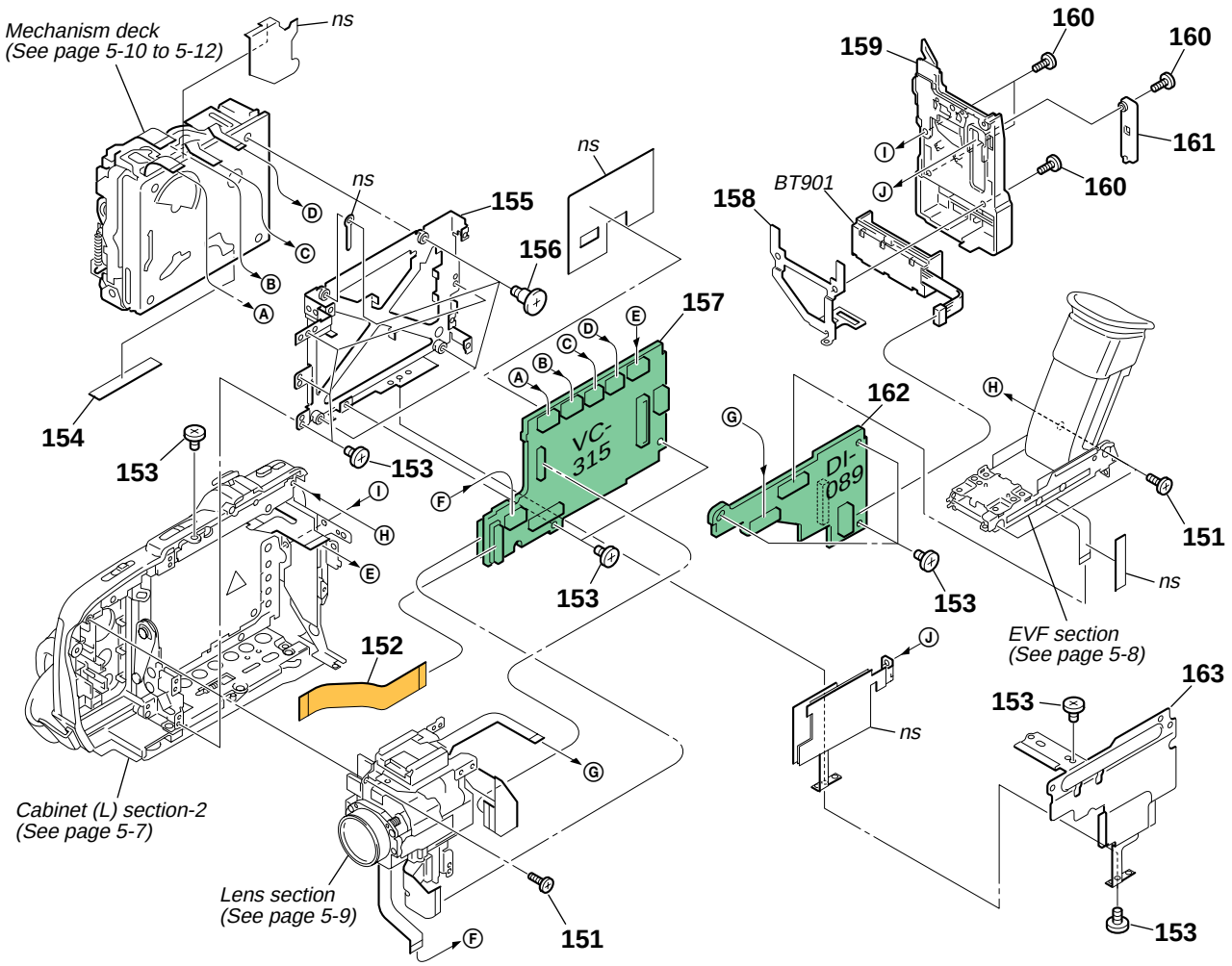
Ref. No.	Part No.	Description
101	3-989-735-31	SCREW (M1.7), LOCK ACE, P2
102	X-3953-155-1	CABINET (C) ASSY, P (TRV38)
102	X-3953-156-1	CABINET (C) ASSY, P (TRV38E)
102	X-3953-157-1	CABINET (C) ASSY, P (TRV39)
* 103	4-942-636-01	EMBLEM (NO.3.5), SONY
104	3-080-791-01	HOLDER, LCD
105	3-078-889-11	SCREW (M1.7)
106	1-961-642-11	HARNESS (PC-121) (20P)
107	1-961-643-11	HARNESS (PC-122) (10P)
108	3-080-792-01	COVER (FRONT), HINGE
109	1-684-320-21	FP-461 FLEXIBLE BOARD
110	X-3953-153-1	HINGE ASSY

Ref. No.	Part No.	Description
111	3-080-793-02	COVER (REAR), HINGE
112	A-7078-563-A	PD-190 BOARD, COMPLETE
113	X-3953-154-1	P FRAME ASSY
114	3-074-080-01	SPRING (P), TORSION COIL
115	3-080-794-01	BUTTON, P OPEN
116	3-080-795-01	CABINET (M), P
117	3-080-797-01	PLATE, GROUND, TOUCH
118	3-080-796-01	CUSHION, TOUCH
ND901	1-477-757-11	BLOCK LIGHT GUIDE PLATE (3.5)
LCD901	1-805-166-11	INDICATOR MODULE,LIQUIDCRYSTAL
LCD902	1-805-144-21	MODULE, CRYSTAL (INDICATION)

Note : The components identified by mark or dotted line with mark are critical for safety. Replace only with part number specified.	**Note :** Les composants identifiés par une marque sont critiques pour la sécurité. Ne les remplacer que par une pièce portant le numéro spécifié.

5-1-4. CABINET (L) SECTION-1

ns : not supplied



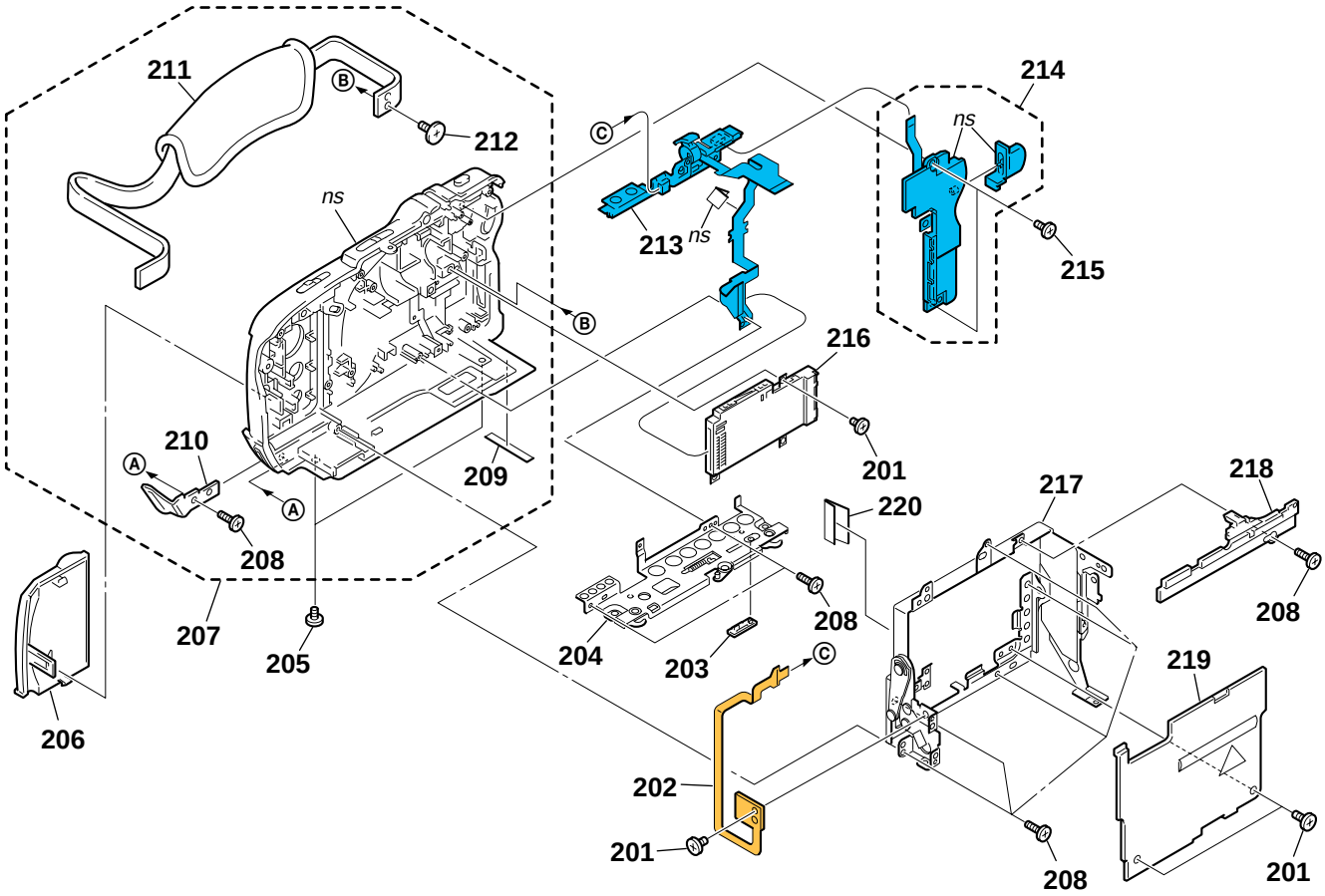
Ref. No.	Part No.	Description
151	3-078-890-21	SCREW, TAPPING
152	1-687-659-11	FP-640 FLEXIBLE BOARD
153	3-078-889-11	SCREW (M1.7)
154	3-059-725-01	LABEL, LS
155	X-3953-135-1	FRAME ASSY, MD
156	3-059-718-01	SCREW (M1.4X1.5)
157	A-7013-695-A	VC-315 (N) BOARD, COMPLETE (SERVICE) (TRV38)
157	A-7013-696-A	VC-315 (P) BOARD, COMPLETE (SERVICE) (TRV38E)
157	A-7013-697-A	VC-315 (NN) BOARD, COMPLETE (SERVICE) (TRV39)
158	3-067-024-01	BRACKET (LOWER), STRAP
159	X-3952-229-2	BT PANEL ASSY
160	3-080-198-31	SCREW(M1.7),LOCK ACE,P2
161	3-067-025-01	CPC LID
162	A-7078-564-A	DI-089 (PA) BOARD, COMPLETE
163	X-3953-169-1	HEAT SINK ASSY, DI
BT901	1-694-772-11	TERMINAL BOARD, BATTERY

COVER

5. REPAIR PARTS LIST

5-1-5. CABINET (L) SECTION-2

ns : not supplied



Ref. No.	Part No.	Description
201	3-078-889-11	SCREW (M1.7)
202	A-7078-582-A	FP-645 BOARD COMPLETE
203	3-073-456-01	EJECT KNOB
204	X-3953-146-1	LOCK ASSY, GRIP
205	3-080-198-11	SCREW(M1.7),LOCK ACE,P2
206	X-3953-164-1	COVER ASSY, JACK
207	X-3953-137-1	CABINET (L) ASSY (TRV38/TRV38E)
207	X-3953-138-1	CABINET (L) ASSY (TRV39)
208	3-078-890-21	SCREW, TAPPING
209	3-055-189-01	FOOT (A)
210	3-081-568-01	BRACKET (FRONT), GRIP BELT

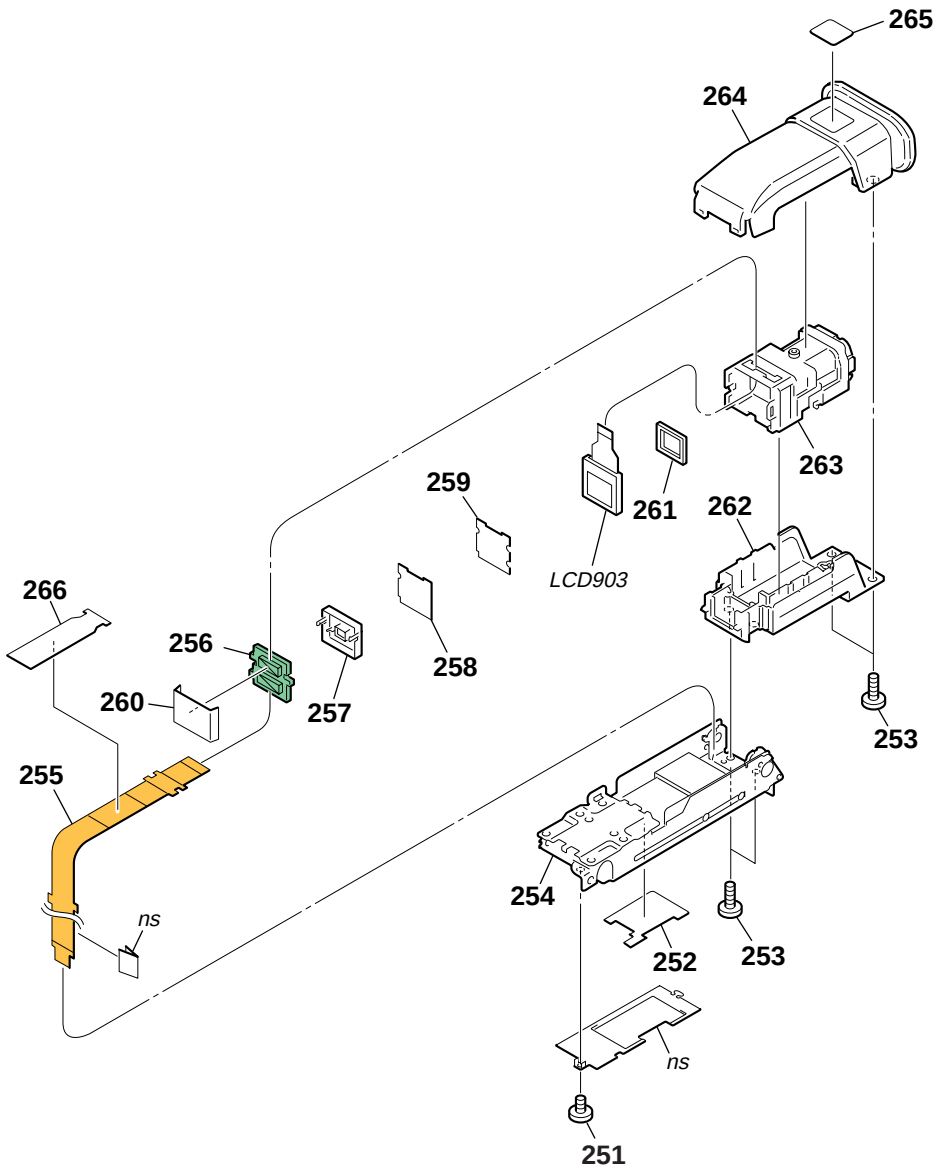
Ref. No.	Part No.	Description
211	3-081-579-01	BELT, GRIP (TRV39)
211	3-081-580-01	BELT, GRIP (TRV38/TRV38E)
212	3-082-266-01	PAN-HEAD SCREW WITH SEAT (M2)
213	1-477-781-21	SWITCH BLOCK, CONTROL (FK-4300)
214	1-477-181-11	SWITCH BLOCK, CONTROL (PS-2890)
215	3-078-890-01	SCREW, TAPPING
216	1-816-271-21	CONNECTOR, MEMORY STICK 10P
217	X-3953-210-1	FRAME ASSY, CS
218	3-080-888-01	ZOOM COVER
219	3-073-457-01	COVER, GRIP
220	3-073-928-01	L SHEET

COVER

5. REPAIR PARTS LIST

5-1-6. EVF SECTION

ns : not supplied



Ref. No.	Part No.	Description
251	3-078-889-11	SCREW (M1.7)
252	3-073-454-01	SHEET, VF FLEXIBLE RETAINER
253	3-083-261-01	SCREW, TAPPING
254	X-3953-165-1	VF BASE ASSY
255	1-684-249-11	FP-435 FLEXIBLE BOARD
256	A-7078-556-A	LB-087 BOARD, COMPLETE
257	3-072-214-01	GUIDE (20), LAMP
258	3-072-211-01	ILLUMINATOR
259	3-072-210-01	SHEET, PRISM

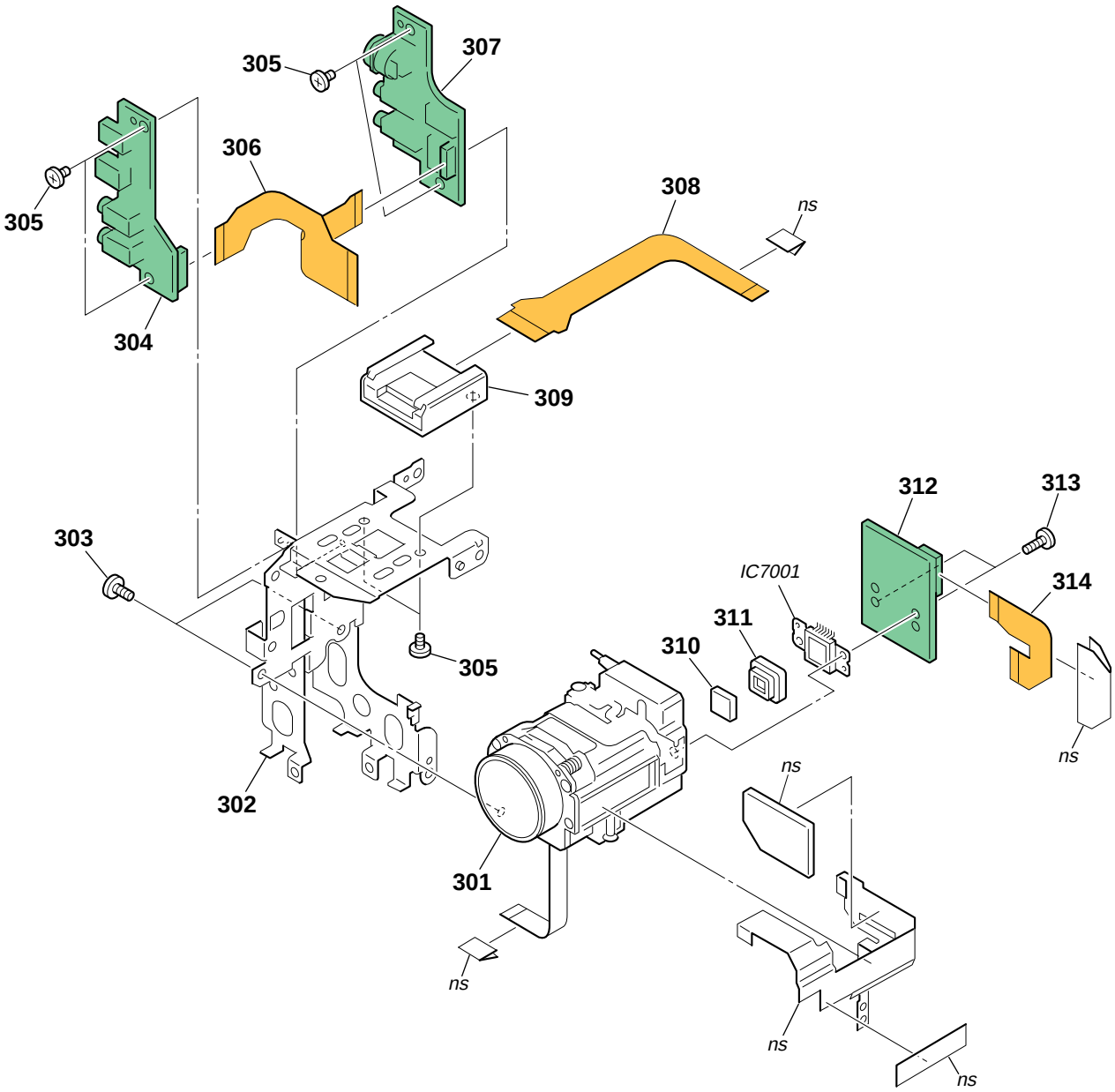
Ref. No.	Part No.	Description
260	3-069-000-01	SHEET, VF ELECTROSTATIC
261	3-059-734-01	CUSHION (1), LCD
262	X-3953-160-1	VF CABINET (LOWER) ASSY
263	X-3951-453-1	LENS ASSY, VF
264	X-3953-161-1	VF CABINET (UPPER) ASSY
265	3-074-433-01	LABEL, COLOR (VF)
266	3-075-373-11	SHEET, FLEXIBLE ELECTROSTATIC
LCD903	8-753-028-47	LCX032AN-J

COVER

5. REPAIR PARTS LIST

5-1-7. LENS SECTION

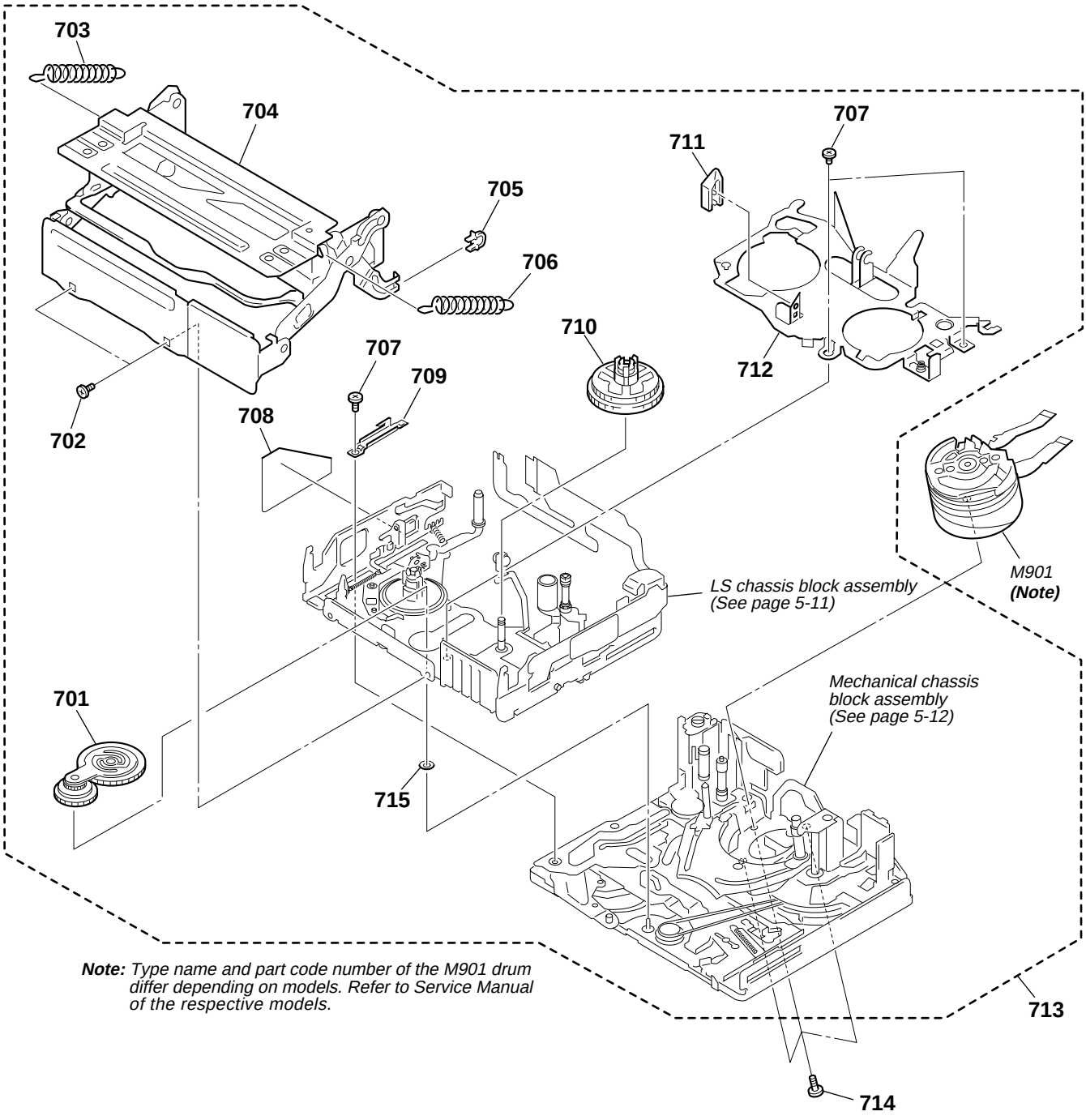
ns : not supplied



Be sure to read “Precautions upon replacing CCD imager” on page 4-9 when changing the CCD imager.

Ref. No.	Part No.	Description
301	8-848-769-01	DEVICE, LENS LSV-751A
302	X-3953-158-1	FRAME ASSY, LENS
303	3-078-890-01	SCREW, TAPPING
304	A-7078-554-A	JK-249 BOARD, COMPLETE (TRV38/TRV38E)
304	A-7078-559-A	JK-249 (N) BOARD, COMPLETE (TRV39)
305	3-078-889-11	SCREW (M1.7)
306	1-687-658-11	FP-639 FLEXIBLE BOARD
307	A-7078-558-A	JK-248 BOARD, COMPLETE
308	1-687-660-11	FP-641 FLEXIBLE BOARD
309	1-793-996-11	CONNECTOR, EXTERNAL
310	1-758-569-11	FILTER BLOCK, OPTICAL
311	3-053-973-01	RUBBER (W), SEAL
312	A-7078-557-A	CD-436 BOARD, COMPLETE
313	3-078-890-21	SCREW, TAPPING
314	1-687-657-11	FP-638 FLEXIBLE BOARD
IC7001	A-7031-359-A	CCD BLOCK ASSY (CCD IMAGER)

5-1-8. OVERALL (MECHANISM DECK-Z100)



Note: *Type name and part code number of the M901 drum differ depending on models. Refer to Service Manual of the respective models.*

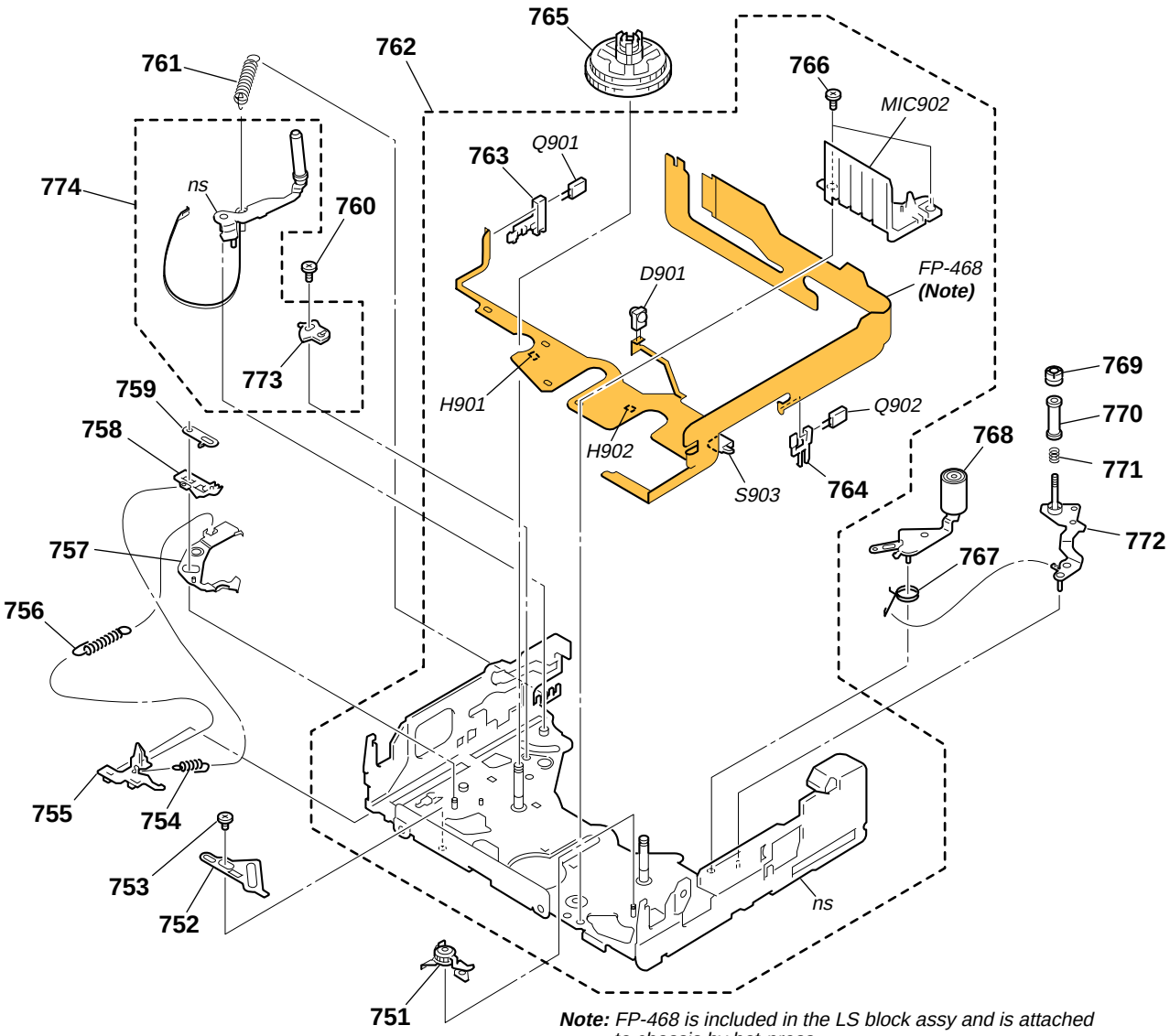
Ref. No.	Part No.	Description
701	X-3952-938-3	GEAR ASSY, GOOSENECK
702	3-075-097-11	SCREW (M1.4X1.4), SPECIAL HEAD
703	3-079-206-02	SPRING (POP UP S), TXTENSION
704	X-3952-939-3	COMPARTMENT ASSY, CASSETTE
705	3-079-367-02	DAMPER, CASSETTE COMPARTMENT
706	3-079-215-02	SPRING (POP UP T), EXTENSION
707	3-703-816-15	SCREW (M1.4), SPECIAL HEAD
708	3-080-545-01	COVER, SENSOR S
709	3-079-364-01	RETAINER, LS GUIDE
710	X-3952-937-1	TABLE ASSY, T REEL
711	3-079-366-01	RELEASE, REEL LOCK
712	X-3953-257-1	PLATE ASSY,RETAINER
713	A-7095-393-A	MD (Z100) SUB ASSY
714	3-079-741-02	SCREW,DRUM FIXING
715	3-748-682-01	WASHER, T
M901	A-7048-981-A	DRUM(DEH-30A-R)(SERVICE)

COVER

5. REPAIR PARTS LIST

5-1-9. LS CHASSIS BLOCK ASSEMBLY

ns : not supplied



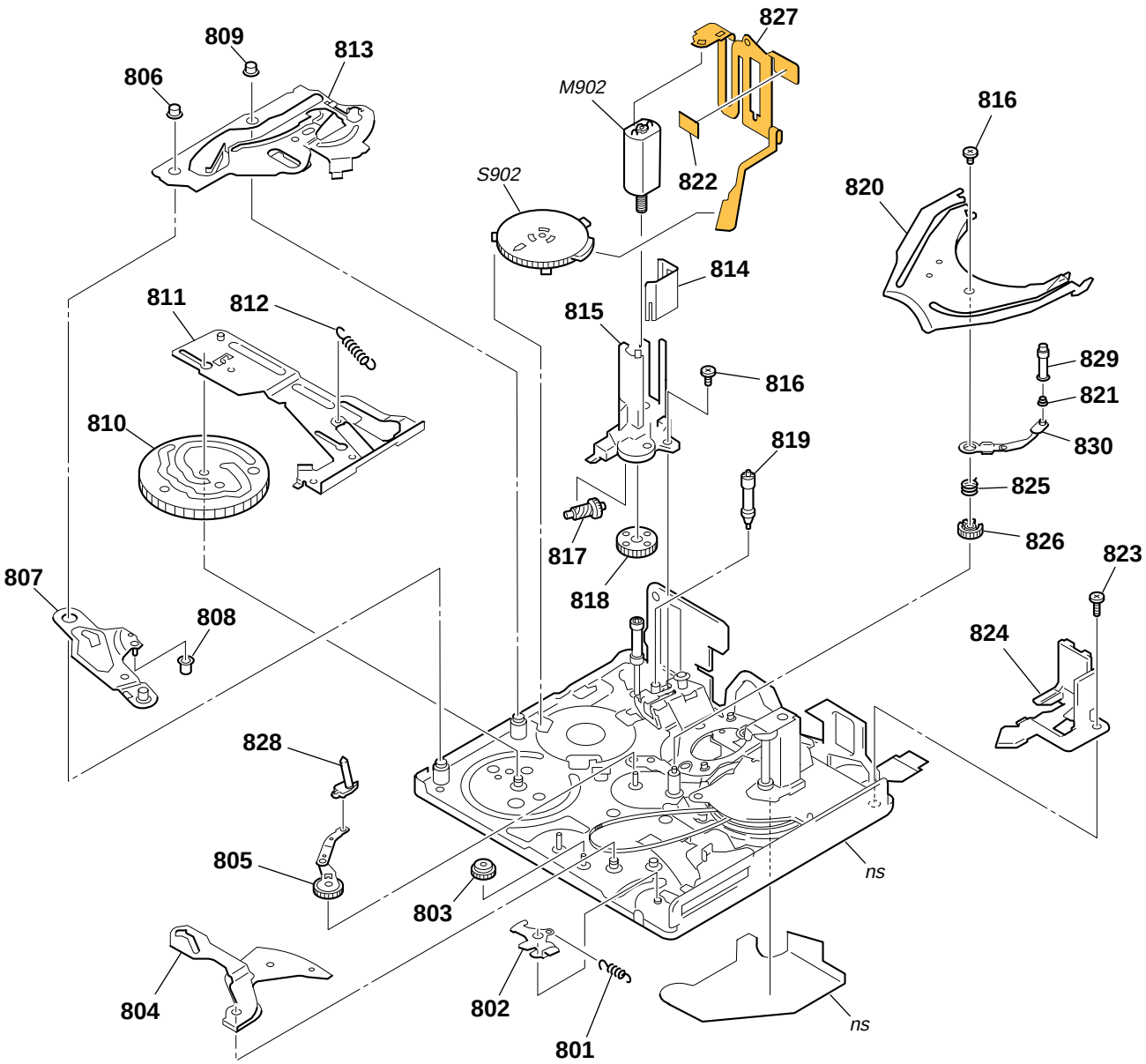
Note: *FP-468 is included in the LS block assy and is attached to chassis by hot-press.*
Because installation of FP-468 requires a very high accuracy, FP-468 is not supplied as an independent service parts.

Ref. No.	Part No.	Description
751	A-7095-402-B	BRAKE (T) BLOCK ASSY
752	3-079-241-01	PLATE, LS CAM
753	3-075-097-11	SCREW (M1.4X1.4), SPECIAL HEAD
754	3-079-246-01	SPRING(RELEASE RACK),EXTENSION
755	3-079-248-01	POSITIONING(S), CASSETTE
756	3-079-244-01	SPRING (ULE), EXTENSION
757	X-3952-932-2	BRAKE ASSY, ULE
758	3-079-245-01	RACK (S), RELEASE
759	3-079-247-01	BRAKE (S)
760	3-059-090-11	SCREW (M1.4X2.5), SPECIAL HEAD
761	3-079-242-01	SPRING, TENSION
762	A-7095-401-A	LS BLOCK ASSY
763	3-079-267-01	HOLDER (S), SENSOR
764	3-079-268-01	HOLDER (T), SENSOR
765	X-3952-936-2	TABLE ASSY, S REEL
766	3-703-816-15	SCREW (M1.4), SPECIAL HEAD

Ref. No.	Part No.	Description
767	3-079-243-02	SPRING (PINCH RETURN), TORSION
768	X-3952-934-1	ARM ASSY, PINCH
769	3-052-062-02	NUT, TG7
770	3-079-219-02	TG7
771	3-081-591-01	SPRING, COMPRESSION (TG7)
772	X-3952-935-3	ARM ASSY, TG7
773	3-079-237-01	ADJUSTOR, BAND
774	A-7095-403-B	TG2 ARM BLOCK ASSY
D901	6-500-471-01	DIODE GL453E00000F (TAPE LED)
H901	8-719-067-74	ELEMENT, HOLE HW-105A-CDE-T (S REEL)
H902	8-719-067-74	ELEMENT, HOLE HW-105A-CDE-T (T REEL)
MIC902	1-817-175-12	PIN, CONNECTOR (WITH DETECTION SWITCH)
S903	1-529-566-51	SWITCH, PUSH (1 KEY) (C.C. DOWN)
Q901	6-550-402-01	TRANSISTOR PT4850FE000F (TAPE END)
Q902	6-550-402-01	TRANSISTOR PT4850FE000F (TAPE TOP)

5-1-10. MECHANICAL CHASSIS BLOCK ASSEMBLY

ns : not supplied



Ref. No.	Part No.	Description
801	3-079-314-01	SPRING (EJ), EXTENSION
802	3-079-327-01	ARM, EJ
803	3-079-323-01	GEAR, CONVERSION
804	3-079-324-01	ARM, GL DRIVING
805	X-3952-928-1	GL (S) ASSY
806	3-079-315-01	ROLLER (S1), LS GUIDE
807	X-3952-925-2	ARM ASSY, LS
808	3-079-320-01	ROLLER, LS
809	3-079-316-01	ROLLER (S2), LS GUIDE
810	3-079-319-01	GEAR, CAM
811	X-3952-941-3	SLIDER ASSY, M
812	3-079-321-02	SPRING (PINCH), EXTENSION
813	X-3952-940-2	PLATE ASSY, TG2 CAM
814	3-079-312-01	SHIELD, MOTOR
815	3-079-307-01	HOLDER, MOTOR
816	3-703-816-15	SCREW (M1.4), SPECIAL HEAD

Ref. No.	Part No.	Description
817	3-079-308-01	SHAFT, WORM
818	3-079-309-01	GEAR, DECELERATION
819	X-3952-942-3	ROLLER ASSY, TG3
820	3-079-325-01	RAIL, GUIDE
821	3-079-295-02	SPRING, TG5
822	1-677-049-11	FP-228 FLEXIBLE BOARD
823	3-079-328-01	SCREW ,SPECIAL
824	3-079-326-02	SUPPORT, TG7
825	3-079-301-01	SPRING (GLT), TORSION
826	3-079-298-01	GEAR (T), GL
827	1-686-798-11	FP-467 FLEXIBLE BOARD
828	X-3952-927-2	COASTER (S) ASSY
829	X-3952-930-4	ROLLER ASSY, TG5
830	X-3952-929-1	COASTER (T) ASSY
M902	A-7095-396-A	MOTOR BLOCK ASSY, L (LOARDING)
S902	1-477-679-11	ROTARY, ENCODER (SWITCH)

5-2. ELECTRICAL PARTS LIST

Ref. No.	Part No.	Description			
	A-7078-557-A	CD-436 BOARD, COMPLETE			
		**********			
	(IC7001 is not included in this COMPLETE board)				
		< CAPACITOR >			
C7001	1-164-004-11	CERAMIC CHIP	0.1uF	10%	25V
C7002	1-107-826-11	CERAMIC CHIP	0.1uF	10.00%	16V
C7003	1-125-777-11	CERAMIC CHIP	0.1uF	10.00%	10V
C7005	1-125-777-11	CERAMIC CHIP	0.1uF	10.00%	10V
C7006	1-107-826-11	CERAMIC CHIP	0.1uF	10.00%	16V
C7008	1-125-777-11	CERAMIC CHIP	0.1uF	10.00%	10V
C7010	1-113-987-11	TANTAL. CHIP	4.7uF	20.00%	25V
C7011	1-104-851-11	TANTAL. CHIP	10uF	20.00%	10V
C7012	1-107-826-11	CERAMIC CHIP	0.1uF	10.00%	16V
C7013	1-125-777-11	CERAMIC CHIP	0.1uF	10.00%	10V
C7014	1-135-259-11	TANTAL. CHIP	10uF	20.00%	6.3V
C7016	1-125-777-11	CERAMIC CHIP	0.1uF	10.00%	10V
		< CONNECTOR >			
CN7001	1-784-421-11	CONNECTOR, FFC/FPC (ZIF) 27P			
		< FERRITE BEAD >			
FB7001	1-414-445-11	FERRITE	0uH		
		< IC >			
IC7001	A-7031-359-A	IC CCD BLOCK ASSY (CCD IMAGER)			
IC7002	6-701-755-01	IC AD80017AJRURL			
		< COIL >			
L7001	1-469-528-91	INDUCTOR	100uH		
L7002	1-469-525-91	INDUCTOR	10uH		
		< TRANSISTOR >			
Q7001	8-729-037-74	TRANSISTOR	UN9213J-(TX).SO		
		< RESISTOR >			
R7001	1-218-990-11	SHORT CHIP	0		
R7002	1-218-941-81	RES-CHIP	100	5%	1/16W
R7003	1-216-864-11	METAL CHIP	0	5%	1/16W
R7004	1-216-864-11	METAL CHIP	0	5%	1/16W
	A-7078-562-A	CK-131 BOARD, COMPLETE			
		**********			
		< BATTERY >			
BT5201	1-756-128-11	BATTERY, LITHIUM (SECONDARY)			

Be sure to read “Precautions upon replacing CCD imager” on page 4-9 when changing the CCD imager.

CAUTION :
Danger of explosion if battery is incorrectly replaced.
Replace only with the same or equivalent type.

Ref. No.	Part No.	Description			
		< CONNECTOR >			
CN5201	1-794-505-21	CONNECTOR, FPC (ZIF) 51P			
CN5202	1-691-344-11	CONNECTOR, FFC/FPC (ZIF) 6P			
CN5203	1-691-344-11	CONNECTOR, FFC/FPC (ZIF) 6P			
CN5204	1-778-506-21	PIN, CONNECTOR (PC BOARD) 2P			
CN5205	1-816-463-11	PIN, CONNECTOR (PC BOARD) 10P			
CN5206	1-794-997-11	PIN, CONNECTOR 20P			
		< DIODE >			
D5201	8-719-062-16	DIODE 01ZA8.2(TPL3)			
D5202	8-719-062-16	DIODE 01ZA8.2(TPL3)			
D5203	8-719-073-03	DIODE MA8082-(K8).S0			
D5207	8-719-062-16	DIODE 01ZA8.2(TPL3)			
		< RESISTOR >			
R5201	1-218-990-11	SHORT CHIP	0		
R5202	1-218-949-11	RES-CHIP	470	5%	1/16W
R5205	1-216-822-11	METAL CHIP	1.2K	5%	1/16W
R5206	1-216-823-11	METAL CHIP	1.5K	5%	1/16W
R5208	1-218-953-11	RES-CHIP	1K	5%	1/16W
		< SWITCH >			
S5201	1-762-805-21	SWITCH, PUSH (1 KEY) (PANEL_OPEN/CLOSE)			
S5202	1-771-138-82	SWITCH, KEY BOARD (RESET)			
S5203	1-771-138-82	SWITCH, KEY BOARD (DISPLAY/BATTERY INFO)			
	A-7078-564-A	DI-089 (PA) BOARD, COMPLETE			
		**********			
		< CAPACITOR >			
C3201	1-128-964-91	TANTAL. CHIP	100uF	20%	6.3V
C3203	1-164-943-11	CERAMIC CHIP	0.01uF	10.00%	16V
C3204	1-164-943-11	CERAMIC CHIP	0.01uF	10.00%	16V
C3205	1-164-943-11	CERAMIC CHIP	0.01uF	10.00%	16V
C3206	1-164-943-11	CERAMIC CHIP	0.01uF	10.00%	16V
C3207	1-164-739-11	CERAMIC CHIP	560PF	5.00%	50V
C3208	1-125-777-11	CERAMIC CHIP	0.1uF	10.00%	10V
C3209	1-113-986-11	TANTAL. CHIP	2.2uF	20.00%	25V
C3210	1-164-937-11	CERAMIC CHIP	0.001uF	10.00%	50V
C3211	1-164-943-11	CERAMIC CHIP	0.01uF	10.00%	16V
C3212	1-164-876-11	CERAMIC CHIP	120PF	5.00%	50V
C3213	1-125-837-91	CERAMIC CHIP	1uF	10%	6.3V
C3214	1-125-837-91	CERAMIC CHIP	1uF	10%	6.3V
C3215	1-125-837-91	CERAMIC CHIP	1uF	10%	6.3V
C3216	1-109-994-11	CERAMIC CHIP	2.2uF	10.00%	10V
C3217	1-164-505-11	CERAMIC CHIP	2.2uF		16V
C3219	1-125-777-11	CERAMIC CHIP	0.1uF	10.00%	10V
C3220	1-125-777-11	CERAMIC CHIP	0.1uF	10.00%	10V
C4002	1-125-777-11	CERAMIC CHIP	0.1uF	10.00%	10V
C4003	1-125-777-11	CERAMIC CHIP	0.1uF	10.00%	10V
C4501	1-125-777-11	CERAMIC CHIP	0.1uF	10.00%	10V
C4502	1-164-874-11	CERAMIC CHIP	100PF	5.00%	50V
C4503	1-107-819-11	CERAMIC CHIP	0.022uF	10.00%	16V
C4504	1-164-941-11	CERAMIC CHIP	0.0047uF	10.00%	16V
C4505	1-115-467-11	CERAMIC CHIP	0.22uF	10.00%	10V

DI-089

Ref. No.	Part No.	Description			
C4506	1-119-923-81	CERAMIC CHIP	0.047uF	10.00%	10V
C4508	1-164-941-11	CERAMIC CHIP	0.0047uF	10.00%	16V
C4509	1-125-837-91	CERAMIC CHIP	1uF	10%	6.3V
C4510	1-164-934-11	CERAMIC CHIP	330PF	10.00%	50V
C4511	1-125-777-11	CERAMIC CHIP	0.1uF	10.00%	10V
C4512	1-165-908-91	CERAMIC CHIP	1uF	10%	10V
C4513	1-107-819-11	CERAMIC CHIP	0.022uF	10.00%	16V
C4514	1-125-777-11	CERAMIC CHIP	0.1uF	10.00%	10V
C4515	1-165-908-91	CERAMIC CHIP	1uF	10%	10V
C4516	1-107-819-11	CERAMIC CHIP	0.022uF	10.00%	16V
C4517	1-164-937-11	CERAMIC CHIP	0.001uF	10.00%	50V
C4520	1-125-827-91	CERAMIC CHIP	1uF	10.00%	25V
C4521	1-115-566-11	CERAMIC CHIP	4.7uF	10%	10V
C4522	1-115-566-11	CERAMIC CHIP	4.7uF	10%	10V
C4523	1-125-838-11	CERAMIC CHIP	2.2uF	10%	6.3V
C4525	1-115-566-11	CERAMIC CHIP	4.7uF	10%	10V
C4526	1-115-566-11	CERAMIC CHIP	4.7uF	10%	10V
C4528	1-127-573-11	CERAMIC CHIP	1uF	10%	16V
C4529	1-127-820-11	CERAMIC CHIP	4.7uF		16V
C4530	1-127-760-11	CERAMIC CHIP	4.7uF	10%	6.3V
C4531	1-127-760-11	CERAMIC CHIP	4.7uF	10%	6.3V
C4532	1-127-760-11	CERAMIC CHIP	4.7uF	10%	6.3V
C4533	1-127-760-11	CERAMIC CHIP	4.7uF	10%	6.3V
C4535	1-115-566-11	CERAMIC CHIP	4.7uF	10%	10V
C4536	1-115-566-11	CERAMIC CHIP	4.7uF	10%	10V
C4538	1-135-259-11	TANTAL. CHIP	10uF	20.00%	6.3V
C4540	1-125-827-91	CERAMIC CHIP	1uF	10.00%	25V
C4541	1-125-926-91	TANTAL. CHIP	4.7uF	20%	6.3V
C4542	1-135-259-11	TANTAL. CHIP	10uF	20.00%	6.3V
C4543	1-135-259-11	TANTAL. CHIP	10uF	20.00%	6.3V
C4544	1-135-259-11	TANTAL. CHIP	10uF	20.00%	6.3V
C4545	1-135-259-11	TANTAL. CHIP	10uF	20.00%	6.3V
C4546	1-135-259-11	TANTAL. CHIP	10uF	20.00%	6.3V
C4547	1-135-259-11	TANTAL. CHIP	10uF	20.00%	6.3V
C4548	1-135-259-11	TANTAL. CHIP	10uF	20.00%	6.3V
C4549	1-135-259-11	TANTAL. CHIP	10uF	20.00%	6.3V
C4550	1-135-259-11	TANTAL. CHIP	10uF	20.00%	6.3V
C4551	1-115-566-11	CERAMIC CHIP	4.7uF	10%	10V
C4552	1-115-566-11	CERAMIC CHIP	4.7uF	10%	10V
C4553	1-135-259-11	TANTAL. CHIP	10uF	20.00%	6.3V
C4554	1-131-862-91	TANTAL. CHIP	47uF	20%	4V
C4555	1-127-820-11	CERAMIC CHIP	4.7uF		16V
C4556	1-127-861-11	CERAMIC CHIP	2.2uF	10%	16V
C4557	1-127-573-11	CERAMIC CHIP	1uF	10%	16V
C4558	1-135-259-11	TANTAL. CHIP	10uF	20.00%	6.3V
C4559	1-135-259-11	TANTAL. CHIP	10uF	20.00%	6.3V
C4561	1-107-826-11	CERAMIC CHIP	0.1uF	10.00%	16V
C4562	1-104-851-11	TANTAL. CHIP	10uF	20.00%	10V
C4563	1-127-861-11	CERAMIC CHIP	2.2uF	10%	16V
C4565	1-115-566-11	CERAMIC CHIP	4.7uF	10.00%	10V
C4566	1-165-875-11	CERAMIC CHIP	10uF	10%	10V
C4567	1-135-259-11	TANTAL. CHIP	10uF	20.00%	6.3V
C4568	1-127-861-11	CERAMIC CHIP	2.2uF	10%	16V
C4570	1-164-943-11	CERAMIC CHIP	0.01uF	10.00%	16V
C4601	1-125-777-11	CERAMIC CHIP	0.1uF	10.00%	10V
C4602	1-125-777-11	CERAMIC CHIP	0.1uF	10.00%	10V
C4603	1-107-819-11	CERAMIC CHIP	0.022uF	10.00%	16V
C4604	1-119-751-11	TANTAL. CHIP	22uF	20.00%	16V
C4605	1-119-751-11	TANTAL. CHIP	22uF	20.00%	16V
C4606	1-119-751-11	TANTAL. CHIP	22uF	20.00%	16V

Ref. No.	Part No.	Description			
C4607	1-109-982-11	CERAMIC CHIP	1uF	10.00%	10V
C4608	1-119-751-11	TANTAL. CHIP	22uF	20.00%	16V
		< CONNECTOR >			
CN3201	1-766-350-21	CONNECTOR, FFC/FPC 20P			
CN4001	1-691-374-11	CONNECTOR, FFC/FPC 10P			
CN4004	1-774-603-21	CONNECTOR, BOARD TO BOARD 100P			
* CN4601	1-580-789-21	PIN, CONNECTOR (SMD) 6P			
		< DIODE >			
D3201	8-719-084-47	DIODE 1SV290(TPL3)			
D4001	6-500-289-01	DIODE MAZW082H0LS0			
D4002	6-500-289-01	DIODE MAZW082H0LS0			
D4502	8-719-421-27	DIODE MA728-(K8).S0			
D4503	8-719-421-67	DIODE MA132WK-(K8).SO			
D4504	8-719-074-08	DIODE MA4ZD03001S0			
D4601	6-500-289-01	DIODE MAZW082H0LS0			
D4603	8-719-056-23	DIODE 1SS387-TPL3			
D4604	8-719-056-23	DIODE 1SS387-TPL3			
D4605	8-719-027-76	DIODE 1SS357-TPH3			
D4606	8-719-027-76	DIODE 1SS357-TPH3			
		< FUSE >			
F4601	1-576-406-21	FUSE 1.4A/32V			
F4602	1-576-406-21	FUSE 1.4A/32V			
F4603	1-576-406-21	FUSE 1.4A/32V			
F4604	1-576-406-21	FUSE 1.4A/32V			
F4605	1-576-406-21	FUSE 1.4A/32V			
F4606	1-576-406-21	FUSE 1.4A/32V			
		< FERRITE BEAD >			
FB001	1-500-444-11	FERRITE	0uH		
FB002	1-500-444-11	FERRITE	0uH		
FB003	1-500-444-11	FERRITE	0uH		
FB004	1-500-444-11	FERRITE	0uH		
FB3201	1-469-676-22	FERRITE	0uH		
FB3202	1-500-329-21	FERRITE	0uH		
		< IC >			
IC3201	8-752-109-08	IC CXA3289BR-T4			
IC3202	8-752-405-57	IC CXD3501AR-T4			
IC4502	6-702-975-01	IC FA7713F-TE2			
IC4503	6-703-227-01	IC TK11131CSCL-G			
		< COIL >			
L3201	1-469-525-91	INDUCTOR	10uH		
L3202	1-469-891-21	INDUCTOR	6.8uH		
L4501	1-416-670-11	INDUCTOR	33uH		
L4502	1-419-354-21	INDUCTOR	22uH		
L4503	1-419-354-21	INDUCTOR	22uH		
L4504	1-419-354-21	INDUCTOR	22uH		
L4505	1-416-670-11	INDUCTOR	33uH		
L4506	1-419-354-21	INDUCTOR	22uH		
L4507	1-416-670-11	INDUCTOR	33uH		
L4508	1-469-524-91	INDUCTOR	4.7uH		

Note :
The components identified by mark or dotted line with mark are critical for safety.
Replace only with part number specified.

Note :
Les composants identifiés par une marque sont critiques pour la sécurité.
Ne les remplacer que par une pièce portant le numéro spécifié.

Ref. No.	Part No.	Description			
L4510	1-469-757-21	INDUCTOR	10uH		
L4511	1-469-524-91	INDUCTOR	4.7uH		
L4512	1-469-524-91	INDUCTOR	4.7uH		
L4513	1-469-524-91	INDUCTOR	4.7uH		
L4514	1-469-524-91	INDUCTOR	4.7uH		
L4515	1-469-524-91	INDUCTOR	4.7uH		
L4516	1-469-524-91	INDUCTOR	4.7uH		
L4517	1-469-524-91	INDUCTOR	4.7uH		
L4518	1-469-524-91	INDUCTOR	4.7uH		
L4519	1-469-524-91	INDUCTOR	4.7uH		
L4521	1-469-524-91	INDUCTOR	4.7uH		
L4522	1-469-524-91	INDUCTOR	4.7uH		
L4523	1-469-524-91	INDUCTOR	4.7uH		
L4524	1-469-524-91	INDUCTOR	4.7uH		
L4525	1-469-524-91	INDUCTOR	4.7uH		
L4526	1-469-524-91	INDUCTOR	4.7uH		
L4527	1-469-524-91	INDUCTOR	4.7uH		
L4601	1-412-056-11	INDUCTOR	4.7uH		
		< LINE FILTER >			
LF4601	1-411-957-11	FILTER, COMMON MODE			
		< TRANSISTOR >			
Q4504	6-550-559-01	TRANSISTOR	XN0NE9200LS0		
Q4505	6-550-559-01	TRANSISTOR	XN0NE9200LS0		
Q4506	6-550-351-01	TRANSISTOR	CPH5812-TL-E		
Q4507	6-550-559-01	TRANSISTOR	XN0NE9200LS0		
Q4508	6-550-351-01	TRANSISTOR	CPH5812-TL-E		
Q4509	6-550-351-01	TRANSISTOR	CPH5812-TL-E		
Q4510	6-550-560-01	TRANSISTOR	CPH5819-TL-E		
Q4511	6-550-377-01	TRANSISTOR	MCH3408-TL-E		
Q4517	6-550-232-01	TRANSISTOR	2SA2029T2LQ/R		
Q4519	8-759-054-50	TRANSISTOR	UP04501008S0		
Q4522	6-550-237-01	TRANSISTOR	2SC5658T2LQ/R		
Q4523	8-729-054-49	TRANSISTOR	UP04401008S0		
Q4524	8-729-216-22	TRANSISTOR	2SA1162-YG-TE85L		
Q4525	8-759-054-50	TRANSISTOR	UP04501008S0		
Q4526	6-550-406-01	TRANSISTOR	MCH3335-S-TL-E		
Q4528	8-729-101-07	TRANSISTOR	2SB798-T1-DLDK		
Q4529	6-550-232-01	TRANSISTOR	2SA2029T2LQ/R		
Q4530	8-759-054-50	TRANSISTOR	UP04501008S0		
Q4531	6-550-232-01	TRANSISTOR	2SA2029T2LQ/R		
Q4532	8-759-054-50	TRANSISTOR	UP04501008S0		
Q4601	8-729-047-68	TRANSISTOR	SSM3K03FE(TPL3)		
Q4602	6-550-404-01	TRANSISTOR	UPA1858GR-9JG-E2-A		
Q4603	8-729-804-41	TRANSISTOR	2SB1122-ST-TD		
Q4604	6-550-119-01	TRANSISTOR	DTC144EMT2L		
Q4608	8-729-056-19	TRANSISTOR	TPC6101(TE85R)		
Q4610	6-550-119-01	TRANSISTOR	DTC144EMT2L		
		< RESISTOR >			
R3201	1-218-985-11	RES-CHIP	470K	5%	1/16W
R3202	1-208-935-11	METAL CHIP	100K	0.5%	1/16W
R3204	1-218-949-11	RES-CHIP	470	5%	1/16W
R3206	1-218-958-11	RES-CHIP	2.7K	5%	1/16W
R3207	1-218-973-11	RES-CHIP	47K	5%	1/16W

Ref. No.	Part No.	Description			
R3208	1-218-975-11	RES-CHIP	68K	5%	1/16W
R3209	1-218-969-11	RES-CHIP	22K	5%	1/16W
R3210	1-218-975-11	RES-CHIP	68K	5%	1/16W
R3211	1-218-989-11	RES-CHIP	1M	5%	1/16W
R3212	1-218-977-11	RES-CHIP	100K	5%	1/16W
R3213	1-208-927-11	METAL CHIP	47K	0.5%	1/16W
R3214	1-218-989-11	METAL CHIP	1M	0.5%	1/16W
R3215	1-218-990-11	SHORT CHIP	0		
R3216	1-216-864-11	METAL CHIP	0	5%	1/16W
R3217	1-216-864-11	METAL CHIP	0	5%	1/16W
R3218	1-218-990-11	SHORT CHIP	0		
R3219	1-218-990-11	SHORT CHIP	0		
R3220	1-218-941-81	RES-CHIP	100	5%	1/16W
R3221	1-218-941-81	RES-CHIP	100	5%	1/16W
R3222	1-218-941-81	RES-CHIP	100	5%	1/16W
R3233	1-218-990-11	SHORT CHIP	0		
R4501	1-218-970-11	METAL CHIP	27K	0.5%	1/16W
R4502	1-218-949-11	RES-CHIP	470	5%	1/16W
R4504	1-216-864-11	METAL CHIP	0	5%	1/16W
R4505	1-216-864-11	METAL CHIP	0	5%	1/16W
R4506	1-216-864-11	METAL CHIP	0	5%	1/16W
R4507	1-216-864-11	METAL CHIP	0	5%	1/16W
R4508	1-216-864-11	METAL CHIP	0	5%	1/16W
R4509	1-216-864-11	METAL CHIP	0	5%	1/16W
R4510	1-218-961-11	RES-CHIP	4.7K	5%	1/16W
R4512	1-218-961-11	RES-CHIP	4.7K	5%	1/16W
R4514	1-218-970-11	RES-CHIP	27K	5%	1/16W
R4515	1-218-953-11	RES-CHIP	1K	5%	1/16W
R4516	1-218-953-11	RES-CHIP	1K	5%	1/16W
R4517	1-208-691-11	METAL CHIP	2.2K	0.5%	1/16W
R4518	1-218-969-11	RES-CHIP	22K	5%	1/16W
R4519	1-208-922-11	METAL CHIP	30K	0.5%	1/16W
R4520	1-208-691-11	METAL CHIP	2.2K	0.5%	1/16W
R4523	1-218-977-11	RES-CHIP	100K	5%	1/16W
R4524	1-216-789-11	METAL CHIP	2.2	5%	1/16W
R4526	1-218-935-11	RES-CHIP	33	5%	1/16W
R4527	1-218-977-11	RES-CHIP	100K	5%	1/16W
R4528	1-218-952-11	RES-CHIP	820	5%	1/16W
R4529	1-208-712-11	METAL CHIP	16K	0.5%	1/16W
R4530	1-208-715-11	METAL CHIP	22K	0.5%	1/16W
R4541	1-218-977-11	RES-CHIP	100K	5%	1/16W
R4544	1-218-977-11	RES-CHIP	100K	5%	1/16W
R4546	1-218-955-11	RES-CHIP	1.5K	5%	1/16W
R4548	1-218-977-11	RES-CHIP	100K	5%	1/16W
R4552	1-208-935-11	METAL CHIP	100K	0.5%	1/16W
R4553	1-208-679-11	METAL CHIP	680	0.5%	1/16W
R4554	1-208-703-11	METAL CHIP	6.8K	0.5%	1/16W
R4558	1-208-695-11	METAL CHIP	3.3K	0.5%	1/16W
R4559	1-208-939-11	METAL CHIP	150K	0.5%	1/16W
R4560	1-208-707-11	METAL CHIP	10K	0.5%	1/16W
R4565	1-218-990-11	SHORT CHIP	0		
R4567	1-216-864-11	METAL CHIP	0	5%	1/16W
R4568	1-216-864-11	METAL CHIP	0	5%	1/16W
R4569	1-216-864-11	METAL CHIP	0	5%	1/16W
R4570	1-216-864-11	METAL CHIP	0	5%	1/16W
R4571	1-216-864-11	METAL CHIP	0	5%	1/16W
R4572	1-216-864-11	METAL CHIP	0	5%	1/16W
R4573	1-216-864-11	METAL CHIP	0	5%	1/16W
R4574	1-216-864-11	METAL CHIP	0	5%	1/16W
R4576	1-218-990-11	SHORT CHIP	0		

DI-089 **FP-635** **FP-645** **JK-248** **JK-249**

Ref. No.	Part No.	Description			
R4577	1-218-973-11	RES-CHIP	47K	5%	1/16W
R4578	1-218-971-11	RES-CHIP	33K	5%	1/16W
R4579	1-218-990-11	SHORT CHIP	0		
R4580	1-218-973-11	RES-CHIP	47K	5%	1/16W
R4581	1-218-961-11	RES-CHIP	4.7K	5%	1/16W
R4582	1-208-715-11	METAL CHIP	22K	0.5%	1/16W
R4583	1-208-712-11	METAL CHIP	16K	0.5%	1/16W
R4584	1-208-707-11	METAL CHIP	10K	0.5%	1/16W
R4585	1-218-977-11	RES-CHIP	100K	5%	1/16W
R4586	1-218-955-11	RES-CHIP	1.5K	5%	1/16W
R4587	1-208-935-11	METAL CHIP	100K	0.5%	1/16W
R4588	1-218-958-11	METAL CHIP	2.7K	0.5%	1/16W
R4589	1-208-701-11	METAL CHIP	5.6K	0.5%	1/16W
R4590	1-216-864-11	METAL CHIP	0	5%	1/16W
R4591	1-216-864-11	METAL CHIP	0	5%	1/16W
R4592	1-218-990-11	SHORT CHIP	0		
R4601	1-218-953-11	RES-CHIP	1K	5%	1/16W
R4604	1-218-977-11	RES-CHIP	100K	5%	1/16W
R4605	1-218-989-11	RES-CHIP	1M	5%	1/16W
R4607	1-216-797-11	METAL CHIP	10	5%	1/16W
R4608	1-218-953-11	RES-CHIP	1K	5%	1/16W
R4609	1-218-963-11	RES-CHIP	6.8K	5%	1/16W
R4611	1-218-953-11	RES-CHIP	1K	5%	1/16W
R4613	1-218-990-11	SHORT CHIP	0		
R4614	1-218-989-11	RES-CHIP	1M	5%	1/16W
R4615	1-218-965-11	RES-CHIP	10K	5%	1/16W

A-7078-581-A FP-635 BOARD, COMPLETE
****

< SWITCH >

S001 1-771-138-82 SWITCH, KEY BOARD (FOCUS)
S002 1-771-138-82 SWITCH, KEY BOARD (BACK LIGHT)

A-7078-582-A FP-645 BOARD, COMPLETE
****

< SWITCH >

S001 1-771-733-31 SWITCH, PUSH (1KEY) (EJECT)

A-7078-558-A JK-248 BOARD, COMPLETE
****

< CONNECTOR >

CN5001 1-779-335-21 CONNECTOR, FFC/FPC 22P

< DIODE >

D5001 8-719-056-85 DIODE UDZSTE-178.2B

< FERRITE BEAD >

FB5002	1-469-179-21	FERRITE	0uH
FB5003	1-469-179-21	FERRITE	0uH
FB5004	1-469-179-21	FERRITE	0uH
FB5005	1-469-179-21	FERRITE	0uH
FB5008	1-500-444-11	FERRITE	0uH
FB5009	1-500-444-11	FERRITE	0uH
FB5010	1-500-444-11	FERRITE	0uH
FB5011	1-500-444-11	FERRITE	0uH

< JACK >

J5002 1-694-651-11 TERMINAL BOARD (S VIDEO/AUDIO/VIDEO)
J5003 1-569-950-41 JACK (SMALL TYPE) (HEADPHONES)

< RESISTOR >

R5001	1-216-864-11	METAL CHIP	0	5%	1/16W
R5002	1-500-444-11	FERRITE	0uH (Note)		
R5003	1-500-444-11	FERRITE	0uH (Note)		
R5005	1-500-444-11	FERRITE	0uH (Note)		
R5006	1-216-864-11	METAL CHIP	0	5%	1/16W
R5007	1-216-864-11	METAL CHIP	0	5%	1/16W
R5009	1-216-864-11	METAL CHIP	0	5%	1/16W

< SENSOR >

SE5001 1-476-807-31 SENSOR, ANGULAR VELOCITY (PITCH)
SE5002 1-476-807-41 SENSOR, ANGULAR VELOCITY (YAW)

< VARISTOR >

VD5001	1-803-974-21	VARISTOR, CHIP	(1608)
VD5003	1-803-974-21	VARISTOR, CHIP	(1608)
VD5004	1-803-974-21	VARISTOR, CHIP	(1608)
VD5005	1-803-974-21	VARISTOR, CHIP	(1608)
VD5006	1-803-974-21	VARISTOR, CHIP	(1608)
VD5007	1-801-862-11	VARISTOR, CHIP	(1608)
VD5008	1-801-862-11	VARISTOR, CHIP	(1608)

A-7078-554-A JK-249 BOARD, COMPLETE (TRV38/TRV38E)
****
A-7078-559-A JK-249 (N) BOARD, COMPLETE (TRV39)
****

< CAPACITOR >

C5101 1-162-970-11 CERAMIC CHIP 0.01uF 10% 25V

< CONNECTOR >

CN5101 1-794-962-11 CONNECTOR, SQUARE TYPE(USB 5P) (TRV38/TRV38E)
CN5101 1-816-862-11 CONNECTOR, SQUARE TYPE (TRV39)
CN5102 1-794-276-11 CONNECTOR, SQUARE TYPE 4P
CN5103 1-779-335-21 CONNECTOR, FFC/FPC 22P

< DIODE >

D5102 8-719-062-16 DIODE 01ZA8.2(TPL3)
D5103 8-719-056-85 DIODE UDZSTE-178.2B
D5104 8-719-056-85 DIODE UDZSTE-178.2B
D5105 8-719-062-16 DIODE 01ZA8.2(TPL3)

< FERRITE BEAD >

FB5103	1-500-444-11	FERRITE	0uH
FB5104	1-500-444-11	FERRITE	0uH
FB5105	1-500-444-11	FERRITE	0uH
FB5106	1-500-444-11	FERRITE	0uH
FB5107	1-500-444-11	FERRITE	0uH

Note : Ferrite is mounted to the location where R5002, 5003, 5005 are printed.

Ref. No.	Part No.	Description			
		< JACK >			
J5101	1-691-737-41	JACK (SMALL TYPE) (MIC (PLUG IN POWER))			
J5103	1-793-995-11	JACK, SUPER SMALL TYPE (LANC)			
		< LINE FILTER >			
LF5101	1-419-100-21	INDUCTOR	0uH		
LF5102	1-419-100-21	INDUCTOR	0uH		
		< RESISTOR >			
R5108	1-216-864-11	METAL CHIP	0	5%	1/16W
		< VARISTOR >			
VD5103	1-801-862-11	VARISTOR, CHIP	(1608)		
VD5104	1-801-862-11	VARISTOR, CHIP	(1608)		
VD5105	1-801-923-11	VARISTOR, CHIP	(1608)		

	A-7078-556-A	LB-087 BOARD, COMPLETE			
		**********			
		< CAPACITOR >			
C6101	1-125-777-11	CERAMIC CHIP	0.1uF	10.00%	10V
C6102	1-164-505-11	CERAMIC CHIP	2.2uF		16V
		< CONNECTOR >			
CN6101	1-691-358-21	CONNECTOR, FFC/FPC (ZIF) 20P			
CN6102	1-691-354-21	CONNECTOR, FFC/FPC (ZIF) 16P			
		< DIODE >			
D5602	6-500-375-01	DIODE NSCW455T-TC9			
		< IC >			
IC6101	8-759-581-11	IC NJM2125F(TE2)			
		< TRANSISTOR >			
Q6102	8-729-054-48	TRANSISTOR	N1B04FE-Y/GR(TPLR3)		
Q6103	6-550-119-01	TRANSISTOR	DTC144EMT2L		
		< RESISTOR >			
R6102	1-208-935-11	METAL CHIP	100K	0.5%	1/16W
R6103	1-208-703-11	METAL CHIP	6.8K	0.5%	1/16W
R6104	1-218-956-11	RES-CHIP	1.8K	5%	1/16W
R6106	1-211-983-11	METAL CHIP	39	0.5%	1/10W
R6107	1-208-675-11	METAL CHIP	470	0.5%	1/16W
R6108	1-208-703-11	METAL CHIP	6.8K	0.5%	1/16W

	A-7078-560-A	MA-423 BOARD, COMPLETE			
		**********			
		< CAPACITOR >			
C5901	1-117-919-11	TANTAL. CHIP	10uF	20.00%	6.3V
		< CONNECTOR >			
CN5901	1-816-232-11	PIN, CONNECTOR (PC BOARD) 4P			
CN5902	1-766-336-21	CONNECTOR, FFC/FPC 6P			
CN5903	1-779-331-11	CONNECTOR, FFC/FPC 14P			

Ref. No.	Part No.	Description			
		< DIODE >			
D5901	6-500-512-01	DIODE CL-330IRS-X-TU			
D5902	8-719-073-01	DIODE MA111-(K8).S0			
D5903	8-719-064-07	DIODE SML-310LTT86			
		< IC >			
IC5901	8-742-221-00	HYB IC SBX3055-01			
		< RESISTOR >			
R5901	1-216-805-11	METAL CHIP	47	5%	1/16W
R5902	1-218-951-11	RES-CHIP	680	5%	1/16W
R5903	1-216-009-91	RES-CHIP	22	5%	1/10W
R5904	1-216-009-91	RES-CHIP	22	5%	1/10W
R5905	1-218-947-11	RES-CHIP	330	5%	1/16W

	A-7078-563-A	PD-190 BOARD, COMPLETE			
		**********			
		< CAPACITOR >			
C5501	1-113-988-11	TANTAL. CHIP	68uF	20.00%	4V
C5502	1-164-943-11	CERAMIC CHIP	0.01uF	10.00%	16V
C5503	1-107-826-11	CERAMIC CHIP	0.1uF	10.00%	16V
C5504	1-164-943-11	CERAMIC CHIP	0.01uF	10.00%	16V
C5505	1-164-943-11	CERAMIC CHIP	0.01uF	10.00%	16V
C5506	1-164-943-11	CERAMIC CHIP	0.01uF	10.00%	16V
C5507	1-135-259-11	TANTAL. CHIP	10uF	20.00%	6.3V
C5508	1-125-777-11	CERAMIC CHIP	0.1uF	10.00%	10V
C5509	1-164-943-11	CERAMIC CHIP	0.01uF	10.00%	16V
C5510	1-125-777-11	CERAMIC CHIP	0.1uF	10.00%	10V
C5512	1-113-986-11	TANTAL. CHIP	2.2uF	20.00%	25V
C5513	1-107-826-11	CERAMIC CHIP	0.1uF	10.00%	16V
C5514	1-164-739-11	CERAMIC CHIP	560PF	5.00%	50V
C5515	1-125-777-11	CERAMIC CHIP	0.1uF	10.00%	10V
C5516	1-125-777-11	CERAMIC CHIP	0.1uF	10.00%	10V
C5517	1-104-851-11	TANTAL. CHIP	10uF	20.00%	10V
C5518	1-162-964-11	CERAMIC CHIP	0.001uF	10%	50V
C5519	1-164-872-11	CERAMIC CHIP	82PF	5.00%	50V
C5520	1-109-982-11	CERAMIC CHIP	1uF	10.00%	10V
C5521	1-109-982-11	CERAMIC CHIP	1uF	10.00%	10V
C5522	1-109-982-11	CERAMIC CHIP	1uF	10.00%	10V
C5523	1-113-994-11	TANTAL. CHIP	6.8uF	20.00%	16V
C5524	1-135-177-21	TANTALUM CHIP	1uF	20%	20V
C5525	1-125-777-11	CERAMIC CHIP	0.1uF	10.00%	10V
C5526	1-125-777-11	CERAMIC CHIP	0.1uF	10.00%	10V
C5527	1-127-573-11	CERAMIC CHIP	1uF	10%	16V
C5529	1-127-573-11	CERAMIC CHIP	1uF	10%	16V
C5530	1-164-943-11	CERAMIC CHIP	0.01uF	10.00%	16V
C5531	1-164-943-11	CERAMIC CHIP	0.01uF	10.00%	16V
C5601	1-125-777-11	CERAMIC CHIP	0.1uF	10.00%	10V
C5702	1-125-777-11	CERAMIC CHIP	0.1uF	10.00%	10V
C5703	1-164-657-11	CERAMIC CHIP	0.015uF	10.00%	50V
C5704	1-125-777-11	CERAMIC CHIP	0.1uF	10.00%	10V
C5706	1-165-875-11	CERAMIC CHIP	10uF	10%	10V
C5707	1-100-371-11	CERAMIC CHIP	12PF	5%	3.15KV

Note :
The components identified by mark or dotted line with mark are critical for safety.
Replace only with part number specified.

Note :
Les composants identifiés par une marque sont critiques pour la sécurité.
Ne les remplacer que par une pièce portant le numéro spécifié.

Ref. No.	Part No.	Description			
		< CONNECTOR >			
CN5501	1-750-344-11	CONNECTOR, FFC/EPC (ZIF) 24P			
CN5601	1-816-463-11	PIN, CONNECTOR (PC BOARD) 10P			
CN5602	1-794-997-11	PIN, CONNECTOR 20P			
CN5603	1-691-344-11	CONNECTOR, FFC/FPC (ZIF) 6P			
CN5604	1-691-384-11	CONNECTOR, FFC/FPC 20P			
CN5701	1-817-387-11	CONNECTOR, FPC (ZIF) 15P			
		< DIODE >			
D5501	8-719-404-50	DIODE MA111-TX			
D5503	8-719-084-47	DIODE 1SV290(TPL3)			
D5504	8-719-073-01	DIODE MA111-(K8).S0			
D5505	8-719-073-01	DIODE MA111-(K8).S0			
D5703	8-719-073-01	DIODE MA111-(K8).S0			
		< IC >			
IC5501	6-702-491-01	IC AN12580A-BB			
IC5502	8-759-714-77	IC LZ9FF474			
IC5601	8-759-573-02	IC BU9735K-E2			
IC5701	8-759-564-49	IC TC7W53FU(TE12R)			
IC5702	8-759-075-70	IC TA75S393F-TE85R			
		< COIL >			
L5501	1-469-555-21	INDUCTOR	10uH		
L5502	1-414-771-91	INDUCTOR	10uH		
L5503	1-414-771-91	INDUCTOR	10uH		
L5504	1-469-525-91	INDUCTOR	10uH		
L5505	1-412-945-11	INDUCTOR	3.3uH		
L5701	1-428-878-11	INDUCTOR	82uH		
		< TRANSISTOR >			
Q5501	6-550-237-01	TRANSISTOR	2SC5658T2LQ/R		
Q5502	6-550-119-01	TRANSISTOR	DTC144EMT2L		
Q5503	8-729-053-70	TRANSISTOR	2SA202800LS0		
Q5504	8-729-054-48	TRANSISTOR	N1B04FE-Y/GR(TPLR3)		
Q5505	8-729-054-48	TRANSISTOR	N1B04FE-Y/GR(TPLR3)		
Q5701	6-550-119-01	TRANSISTOR	DTC144EMT2L		
Q5702	6-550-065-01	TRANSISTOR	CPH5504-TL-E		
Q5704	8-729-054-45	TRANSISTOR	UP04312008S0		
		< RESISTOR >			
R5501	1-218-990-11	SHORT CHIP	0		
R5503	1-218-985-11	RES-CHIP	470K	5%	1/16W
R5504	1-218-970-11	METAL CHIP	27K	0.5%	1/16W
R5505	1-218-980-11	RES-CHIP	180K	5%	1/16W
R5506	1-218-985-11	RES-CHIP	470K	5%	1/16W
R5507	1-218-953-11	RES-CHIP	1K	5%	1/16W
R5508	1-218-977-11	RES-CHIP	100K	5%	1/16W
R5510	1-218-958-11	RES-CHIP	2.7K	5%	1/16W
R5511	1-218-973-11	RES-CHIP	47K	5%	1/16W
R5512	1-218-973-11	RES-CHIP	47K	5%	1/16W
R5513	1-218-975-11	RES-CHIP	68K	5%	1/16W
R5514	1-218-969-11	RES-CHIP	22K	5%	1/16W
R5515	1-218-975-11	RES-CHIP	68K	5%	1/16W
R5516	1-218-989-11	RES-CHIP	1M	5%	1/16W
R5517	1-218-977-11	RES-CHIP	100K	5%	1/16W

Ref. No.	Part No.	Description			
R5518	1-218-989-11	RES-CHIP	1M	5%	1/16W
R5520	1-218-990-11	SHORT CHIP	0		
R5522	1-218-990-11	SHORT CHIP	0		
R5524	1-218-965-11	RES-CHIP	10K	5%	1/16W
R5527	1-218-973-11	RES-CHIP	47K	5%	1/16W
R5529	1-218-960-11	RES-CHIP	3.9K	5%	1/16W
R5530	1-218-977-11	RES-CHIP	100K	5%	1/16W
R5531	1-218-977-11	RES-CHIP	100K	5%	1/16W
R5534	1-218-990-11	SHORT CHIP	0		
R5601	1-218-941-81	RES-CHIP	100	5%	1/16W
R5602	1-216-855-11	METAL CHIP	680K	5%	1/16W
R5703	1-218-965-11	RES-CHIP	10K	5%	1/16W
R5704	1-218-980-11	RES-CHIP	180K	5%	1/16W
R5705	1-218-969-11	RES-CHIP	22K	5%	1/16W
R5706	1-216-824-11	METAL CHIP	1.8K	5%	1/16W
R5707	1-218-968-11	RES-CHIP	18K	5%	1/16W
R5708	1-218-969-11	RES-CHIP	22K	5%	1/16W
R5709	1-218-941-81	RES-CHIP	100	5%	1/16W
R5710	1-218-949-11	RES-CHIP	470	5%	1/16W
		< COMPOSITION CIRCUIT BLOCK >			
RB5501	1-234-372-21	RES, NETWORK 100X4	(1005)		
RB5502	1-234-378-21	RES, NETWORK 10KX4	(1005)		
RB5503	1-234-384-11	RES, NETWORK 1MX4	(1005)		
		< TRANSFORMER >			
T5701	1-437-472-11	TRANSFORMER, INVERTER			

	A-7078-561-A	SE-136 BOARD, COMPLETE
		**********
		< CONNECTOR >
CN6301	1-779-327-11	CONNECTOR, FFC/FPC 6P
		< PHOTO INTERRUPTER >
PH6301	8-749-016-83	IC GP1S092HCPI
PH6302	8-749-016-83	IC GP1S092HCPI

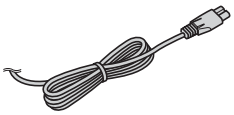
	A-7013-695-A	VC-315 (N) BOARD, COMPLETE (SERVICE) (TRV38)
		**********
	A-7013-696-A	VC-315 (P) BOARD, COMPLETE (SERVICE) (TRV38E)
		**********
	A-7013-697-A	VC-315 (NN) BOARD, COMPLETE (SERVICE) (TRV39)
		**********

Electrical parts list of the VC-315 board are not shown.
Pages from 5-19 to 5-27 are not shown.

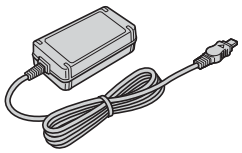
Note :	Note :
The components identified by mark or dotted line with mark are critical for safety. Replace only with part number specified.	Les composants identifiés par une marque sont critiques pour la sécurité. Ne les remplacer que par une pièce portant le numéro spécifié.

Checking supplied accessories.

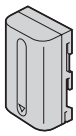
Make sure that the following accessories are supplied with your camcorder.



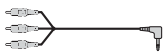
Power cord (Main lead)(1)
(TRV38:E/TRV38E:E)
1-769-608-11
Power cord (Main lead)(1)
(TRV38:KR)
1-776-985-11
Power cord (Main lead)(1)
(TRV38E:CH)
1-782-476-11
Power cord (Main lead)(1)
(TRV38:HK/TRV38E:HK)
1-783-374-11
Power cord (Main lead)(1)
(TRV38:US, CND/TRV39)
1-790-107-22
Power cord (Main lead)(1)
(TRV38:JE/TRV38E:JE)
1-790-732-11



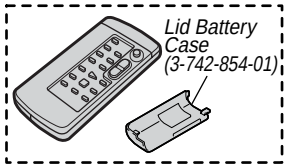
AC power adaptor (1)
(AC-L15A/L15B)
1-477-533-31



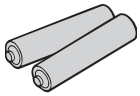
NP-FM30 battery pack (1)
A-7096-387-A
(US, CND)
A-7096-388-B
(EXCEPT US, CND)



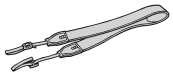
A/V connecting cable (1.5m) (1)
1-824-097-11



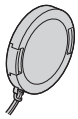
Wireless Remote Commander (1)
(RMT-814E)
1-475-141-61



R6 (size AA) batteries for the Remote Commander (2)
(not supplied)



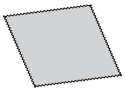
Shoulder strap (1)
3-987-015-01



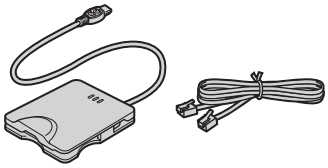
Lens cap (1)
X-3950-537-1

"Memory Stick" (1)
(MSA-8A)
A-7024-735-A

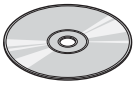
USB cable (1)
1-823-932-11



Cleaning cloth (1)
(not supplied)

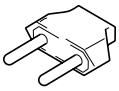


UNA-PSTN MODEM Adaptor (1)
(TRV39 only)
(not supplied)

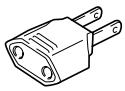


CD-ROM
(SPVD-010 USB Driver) (1)
(TRV38:E,HK,JE,KR/TRV38E)
3-078-942-01
CD-ROM
(SPVD-010 (I) USB Driver) (1)
(TRV38:US,CND/TRV39)
3-078-943-01

Stylus (1)
(TRV39 only)
3-073-941-01



2-pin conversion adaptor (1)
(TRV38:JE/TRV38E:JE only)
1-569-007-12



2-pin conversion adaptor (1)
(TRV38:E, HK/TRV38E:E,HK)
1-569-008-12

• Abbreviation

CND	: Canadian model	JE	: Tourist model
HK	: Hong Kong model	KR	: Korea model
CH	: Chinese model		

Other accessories

3-080-164-11	MANUAL, INSTRUCTION (ENGLISH) (TRV38:US,CND,E,HK,JE/TRV39)
3-080-164-21	MANUAL, INSTRUCTION (FRENCH) (TRV38:CND/TRV39:CND)
3-080-164-31	MANUAL, INSTRUCTION (PORTUGUESE) (TRV38:E,JE)
3-080-164-41	MANUAL, INSTRUCTION (CHINESE) (TRV38:E,HK)
3-080-164-51	MANUAL, INSTRUCTION (KOREAN) (TRV38:JE,KR)
3-080-167-11	MANUAL, INSTRUCTION (ENGLISH/FRENCH) (TRV38E)
3-080-167-21	MANUAL, INSTRUCTION (SWEDISH/RUSSIAN) (TRV38E:E,JE)
3-080-167-31	MANUAL, INSTRUCTION (ARABIC/PERSIAN) (TRV38E:E)
3-080-167-41	MANUAL, INSTRUCTION (CHINESE) (TRV38E:HK)
3-080-167-51	MANUAL, INSTRUCTION (CHINESE) (TRV38E:E,CH,JE)
3-080-307-11	MANUAL, INSTRUCTION (ENGLISH) (TRV39)

Note : The components identified by mark or dotted line with mark are critical for safety. Replace only with part number specified.	**Note :** Les composants identifiés par une marque sont critiques pour la sécurité. Ne les remplacer que par une pièce portant le numéro spécifié.

9-876-230-31

Sony EMCS Co.

2003B1600-1
©2003.2
Published by DI Customer Center

Revision History

Ver.	Date	History	Contents	S.M. Rev. issued
1.0	2003.02	Official Release	—	—

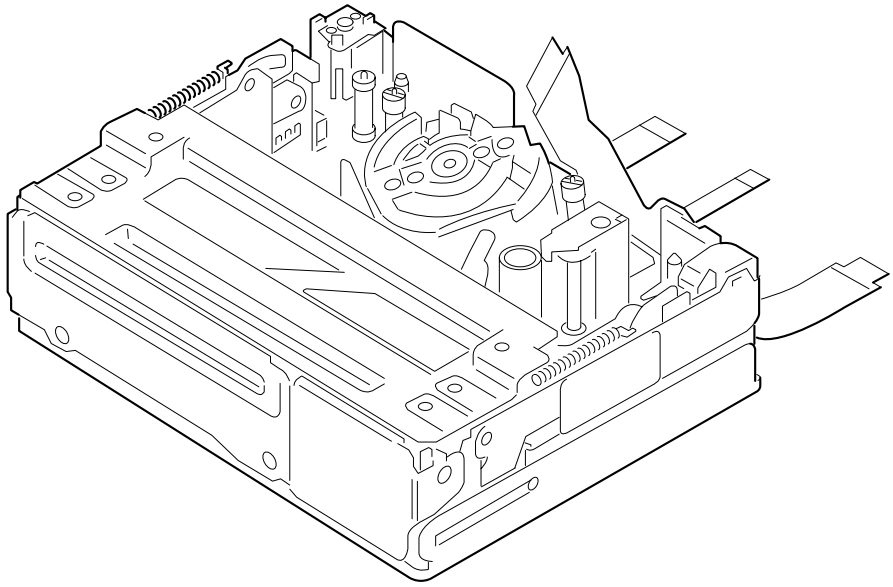
DV MECHANICAL ADJUSTMENT MANUAL VII

Ver 1.0 2003. 01

Z MECHANISM

Mini DV Digital Video Cassette

Please use this manual with the service manual of the respective models.



The capstan motor and the drum base block assy of this mechanism require very high precision work to install them in the mechanism. Therefore, the capstan motor and the drum base block assy are not supplied as the repair part independently. They are supplied as MD (Z100) SUB block assy.

Digital MECHANISM DECK

SONY

TABLE OF CONTENTS

1. Preparations for Check, Adjustment and Replacement of Mechanism Block

1-1. Cassette Compartment Assy, Damper Assy ····· 3

2. Periodic Inspection and Maintenance

2-1. Rotary Drum Cleaning ····· 4
2-2. Tape Path System Cleaning (Refer to Fig. 2-1.) ····· 4
2-3. Periodic Inspection List ····· 5
2-4. Service Jigs and Tools ····· 6
2-5. Mode Selector II Operating Procedure ····· 8
2-5-1. Introduction ····· 8
2-5-2. Operation ····· 8
2-5-3. Mechanism Status (Position) Transition Table Using Mode Selector II ····· 11
2-5-4. Battery Alarm Indication ····· 11

3. Check, Adjustment and Replacement of Mechanical Parts

3-1. Flowchart of Replacement of Mechanical Parts ····· 12
3-2. Drum ····· 13
3-3. Cassette Compartment Assy ····· 14
3-4. TG7 Support ····· 15
3-5. Motor Holder Block Assy and L Motor Block Assy ····· 16
3-6. MIC Terminal (MIC902) ····· 17
3-7. LED (D901) ····· 18
3-8. Retainer Plate ····· 19
3-9. T Reel Table Assy ····· 20
3-10. Brake (S) and Release Rack (S) ····· 21
3-11. Band Adjuster, S Reel Table Assy and TG2 Arm Block Assy ····· 22
3-12. ULE Brake Assy ····· 23
3-13. Cassette Positioning (S) ····· 24
3-14. TG7 Arm Block Assy and Pinch Arm Assy ····· 25
3-15. TG7 ····· 26
3-16. Gooseneck Gear Assy ····· 27
3-17. LS Guide Retainer and LS Cam Plate ····· 28
3-18. LS Chassis Block Assy and Mechanical Chassis Block Assy ····· 29
3-19. Brake (T) Block Assy ····· 30
3-20. END Sensor (Q901) ····· 31
3-21. TOP Sensor (Q902) ····· 32
3-22. C-IN Switch (S903), S Reel Sensor (H901) and T Reel Sensor (H902) ····· 33
3-23. Guide Rail ····· 34
3-24. Conversion Gear ····· 35
3-25. Coaster (S) Block Assy and Coaster (T) Block Assy ····· 36
3-26. TG5 Roller Assy and GL Gear (T) ····· 37
3-27. TG2 Cam Plate Assy ····· 38
3-28. LS Arm Assy ····· 39
3-29. M Slider Assy (1) ····· 40
3-30. M Slider Assy (2) ····· 41
3-31. EJ Arm ····· 42
3-32. Cam Gear and GL Driving ····· 43
3-33. Rotary Encoder (S902) ····· 44
3-34. FP-228 Flexible Board (DEW SENSOR) and FP-467 Flexible Board ····· 45

4. Adjustment

4-1. FWD Position Adjustment ····· 47
4-2. Reel Torque Check ····· 47
4-3. LS Cam Plate Position Adjustment ····· 48
4-4. Tape Path Adjustment ····· 49

5. Exploded Views

Overall Mechanism Deck Section (Z100) ····· 53
LS Chassis Block Assembly ····· 54
Mechanical Chassis Block Assembly ····· 55

6. Schematic Diagrams ····· 56

7. Printed Wiring Boards ····· 57

1. Preparations for Check, Adjustment and Replacement of Mechanism Block

- Refer to the "DISASSEMBLY" section of the SERVICE MANUAL of the respective models for details of removing cabinets and printed wiring boards.
- When making any adjustment to a mechanism or replacing mechanical parts, be sure to use the Mode Selector II and select the appropriate status of the mechanical deck such that the mechanical status is suitable for the desired work. Refer to section "2-5. Mode Selector II" for details on how to enter the mode shown in a rectangle [____] mode in subsequent paragraphs of this manual.

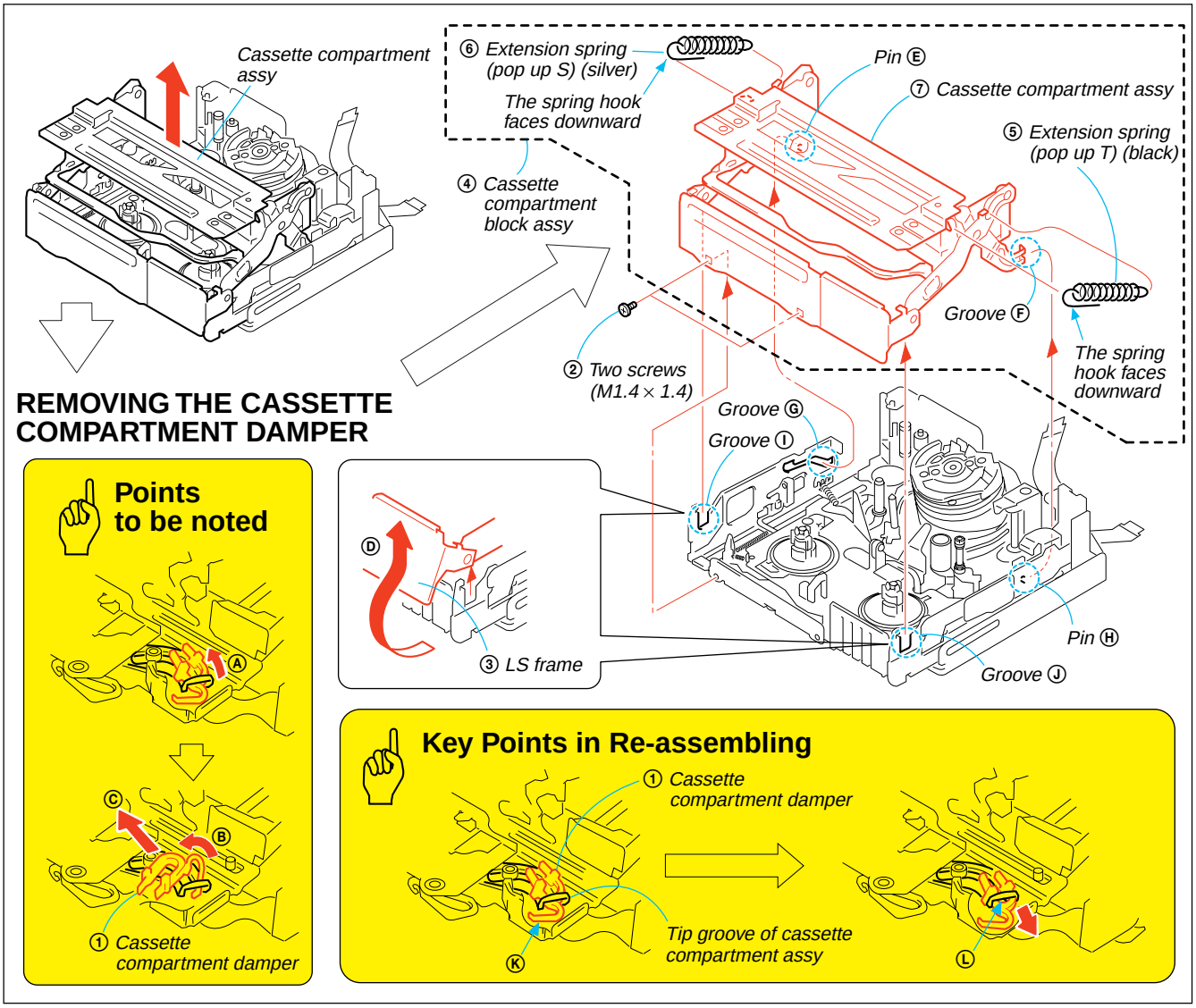
1-1. Cassette Compartment Assy, Damper Assy

1. Removal procedure

1) Set the [EJ] mode.
2) Press the cassette compartment down halfway. Pull the cassette compartment damper ① in the direction of the arrow Ⓐ. Then rotate it in the Ⓑ direction, and remove it in the direction of Ⓒ.
3) Remove the two screws (special head screw M1.4 × 1.4) ②.
4) Remove the LS chassis block assy ③ in the direction of the arrow Ⓓ.
5) Remove the pin Ⓔ and groove Ⓕ of the cassette compartment assy ④ from the LS chassis groove Ⓖ and pin Ⓗ. Then remove the cassette compartment block assy ④.
6) Remove the tension spring (POP UP T) (black) ⑤.
7) Remove the tension spring (POP UP S) (silver) ⑥.Then remove the cassette compartment assy ⑦.

2. Attachment procedure

1) Set the [ULE] mode.
2) Install the tension spring (cassette compartment S) (POP UP S) (silver) ⑥ in to the cassette compartment assy ⑦. (The spring should be hooked on the front stay with the spring end facing upward.)
3) Install the tension spring (cassette compartment T) (POP UP T) (black) ⑤ in to the cassette compartment assy ⑦. (The spring should be hooked on the front stay with the spring end facing upward.)
4) Install the pin Ⓔ and groove Ⓕ of the cassette compartment assy ④ into the LS chassis groove Ⓖ and pin Ⓗ.
5) In the status that the LS block assy ③ is kept open, insert it into the grooves Ⓘ and Ⓙ of the LS chassis block assy.
6) Close the LS chassis block assy ③ in the direction opposite to the arrow Ⓓ, and install it with the two screws (special head screw M1.4 × 1.4) ②.
   Tightening torque: 0.059 ± 0.01N•m (0.6 ± 0.1kgf•cm)
7) The cassette compartment down halfway. Pass the Ⓚ portion of the cassette compartment damper ① through the groove at the tip of the cassette compartment. Then pull the Ⓛ portion and fix it using tweezers or something.



2. Periodic Inspection and Maintenance

- Be sure to perform the following maintenance and inspection so that the machine delivers its full performance and functions, and to protect the machine and tape. Also, perform the following maintenance items after completing the repair work, regardless of the number of hours the machine has been operated by the user.

2-1. Rotary Drum Cleaning

1) Press a wiping cloth (Ref. No. J-2) moistened with cleaning fluid (Ref. No. J-1) lightly against the rotary drum. Rotate the upper drum with a super-fine applicator slowly in the counter-clockwise direction to clean the rotary drum.

Caution: Never rotate the rotary drum by turning on the main power of the motor or rotate it in the clockwise direction. Never move the cloth vertically against the head tip, as this will surely damage the video head; the video head must not be cleaned by any other different methods.

2-2. Tape Path System Cleaning (Refer to Fig. 2-1.)

1) Set the EJECT state. Clean the tape running path (TG-1, -2, -3, -4, -5, -6 and -7, pinch roller and capstan shaft) and lower drum with a super-fine applicator (Ref. J-3) moistened with cleaning fluid.

Note 1: Be careful not to allow oil or grease of the various link mechanisms to get on the super-fine applicator (Ref. J-3).
Note 2: Once the super-fine applicator has been moistened with alcohol, do not use it to clean other mechanical parts such as the tape guide. However, the pinch roller is cleaned with alcohol.
Note 3: When cleaning the capstan shaft, be carefull not to move the oil seal. If the oil seal is moved, oil will leak.

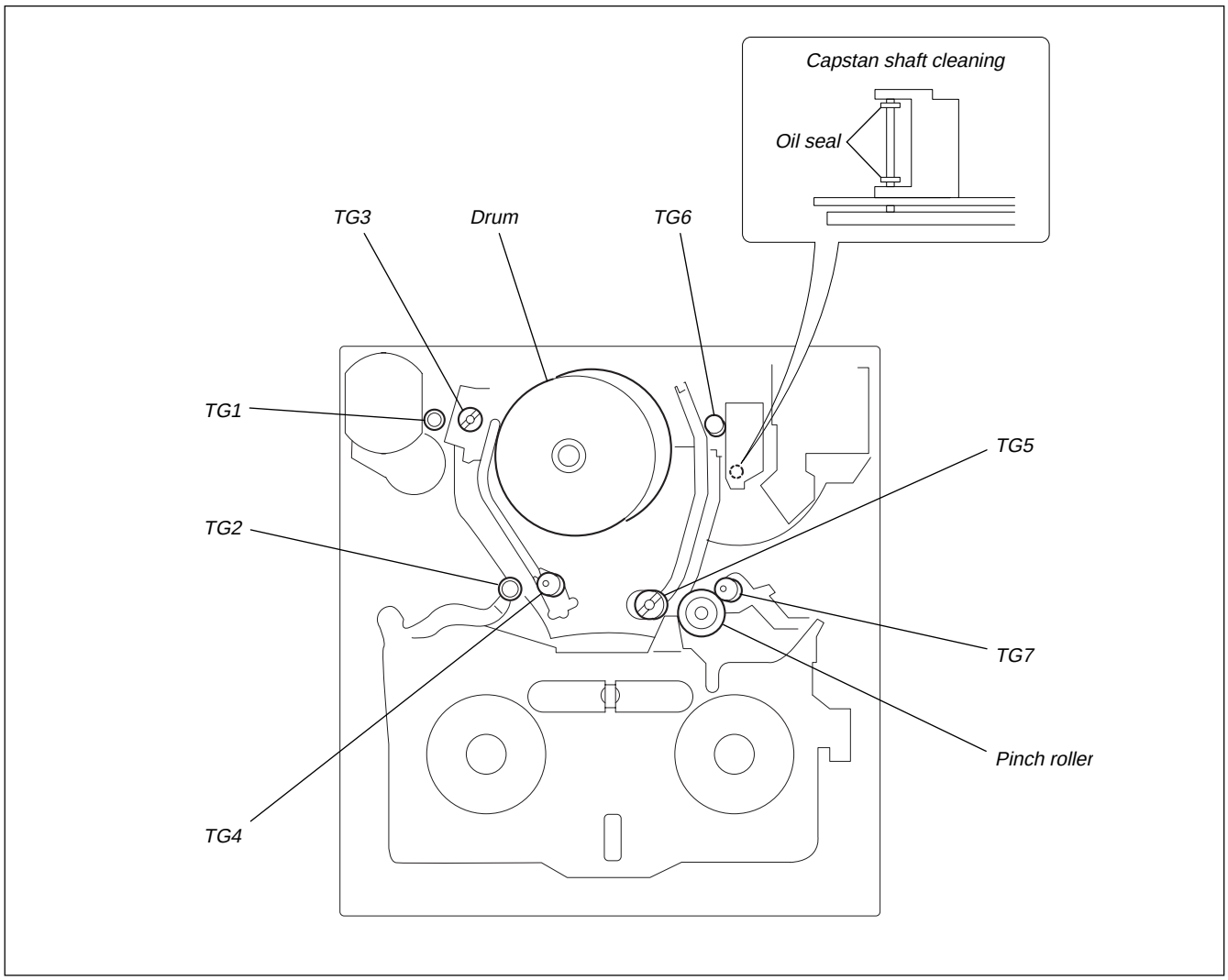


Fig. 2-1

2-3. Periodic Inspection List

Maintenance and inspection item		Operating hours (H)										Remarks
		500	1000	1500	2000	2500	3000	3500	4000	4500	5000	
	Tape running surface cleaning	○	○	○	○	○	○	○	○	○	○	Be careful not to attach oil
	Rotary drum cleaning and degaussing	○	○	○	○	○	○	○	○	○	○	Be careful not to attach oil
Drive mechanism	Capstan bearing	—	☆	—	☆	—	☆	—	☆	—	☆	
Drive mechanism	Loading motor	—	☆	—	☆	—	☆	—	☆	—	☆	
Performance check	Abnormal sound	☆	☆	☆	☆	☆	☆	☆	☆	☆	☆	
Performance check	Back-tension measurement	—	☆	—	☆	—	☆	—	☆	—	☆	
Performance check	Brake system	—	☆	—	☆	—	☆	—	☆	—	☆	
Performance check	Brake system	—	☆	—	☆	—	☆	—	☆	—	☆	
Performance check	FWD/RVS torque measurement	—	☆	—	☆	—	☆	—	☆	—	☆	

○: Cleaning, ☆: Check

Note 1: When the machine is overhauled, replace the parts referring to the above list.

Note 2: Grease

- Be sure to use the specified grease only. (If grease of different viscosity is used, it can cause various troubles.)
- The grease must not contain any dust or other matter. (otherwise it can cause various trouble.)
- Observe the noted amount of grease. (otherwise the oozed grease can cause troubles.)
- Suncall FG-87HSR

2-4. Service Jigs and Tools

Ref. No.	Name	Part code	Jig inscription	Used for
J-1	Cleaning fluid	Y-2031-001-0		
J-2	Wiping cloth	7-741-900-53		
J-3	Super-fine applicator (made by Nippon Applicator (P752D))	—		
J-4	Mirror (small oval type)	J-6080-840-A	GD-2038	Tape path
J-5	Tracking tape (XH2-1) (NTSC, PAL)	8-967-997-01		Tape path
J-6	Mini DV torque cassette	J-6082-360-A		
J-7	FWD/BACK T adjustment screwdriver	J-6082-187-A		For TG2 FWD position adjustment
J-8	Torque screwdriver	J-9049-330-A		
J-9	Tape path screwdriver	J-6082-026-A		For tape path adjustment
J-10	Adjustment remote commander (RM-95 upgraded)	J-6082-053-B		
J-11	Mode Selector II	J-6082-282-B		General adjustment (ROM version 1.8)
J-12	Mode Selector II conversion board (Z)	J-6082-493-A		
J-13	Mode Selector II ROM (supporting Z mechanism) * Note 1	J-6082-314-G		ROM for Mode Selector II

Other required equipment: Oscilloscope

Note 1: This is the ROM used for upgrading the version of Mode Selector II to enable it to be used for the Z mechanism.

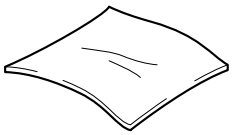
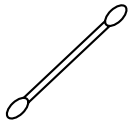
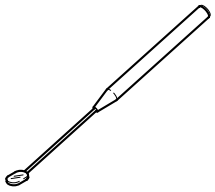
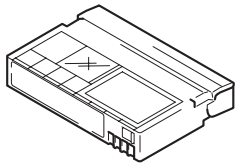
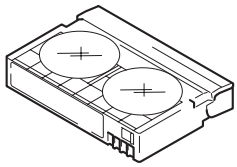
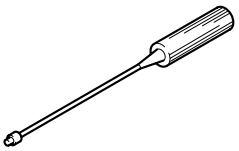
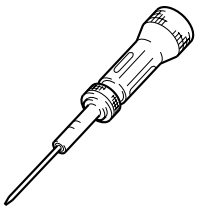
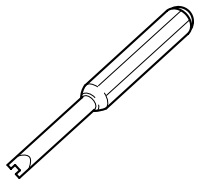
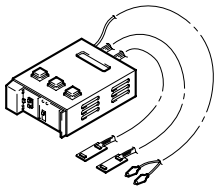
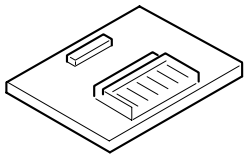
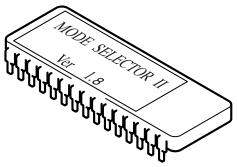
J-1	***J-2*** 	***J-3*** 	***J-4*** 	***J-5*** 
J-6 	***J-7*** 	***J-8*** 	***J-9*** 	***J-10***
J-11 	***J-12*** 	***J-13*** 		

Fig. 2-2

2-5. Mode Selector II Operating Procedure

2-5-1. Introduction

The Mode Selector II is a mechanism drive tool that assists maintenance work of the various mechanism decks. It has the following functions.

1. Manual Test

In this mode, the motor of the mechanism deck is powered only during the period while the switch is turned on manually. Using the Manual Test, the operator can freely control the motor of the mechanism deck.

2. Step Test

In this mode, the motor of the mechanism deck is kept turned on until the mechanical status is changed from the present mechanical status that is obtained from the sensor information. The Step Test is used to confirm a series of movements of the mechanism deck.

3. Auto Test

The Mode Selector II stores the status transition table in its memory as data indicating the respective modes of the mechanism deck. The status transition table can be used to confirm whether a mechanism deck is operating normally or has abnormality from a series of movements of a mechanism deck. If an abnormal status transition is detected during operation, the "NG" indication appears and the mechanism stops moving.

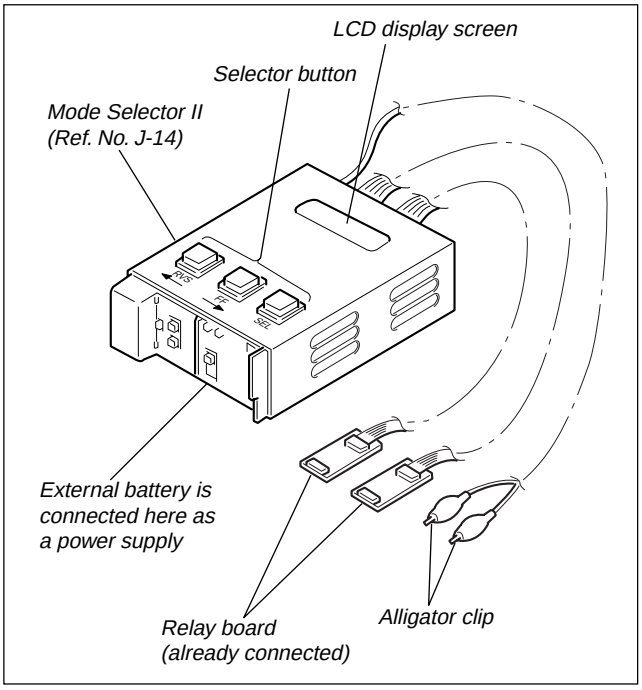


Fig. 2-3

Mode Selector II (J-6082-282-B) connection diagram

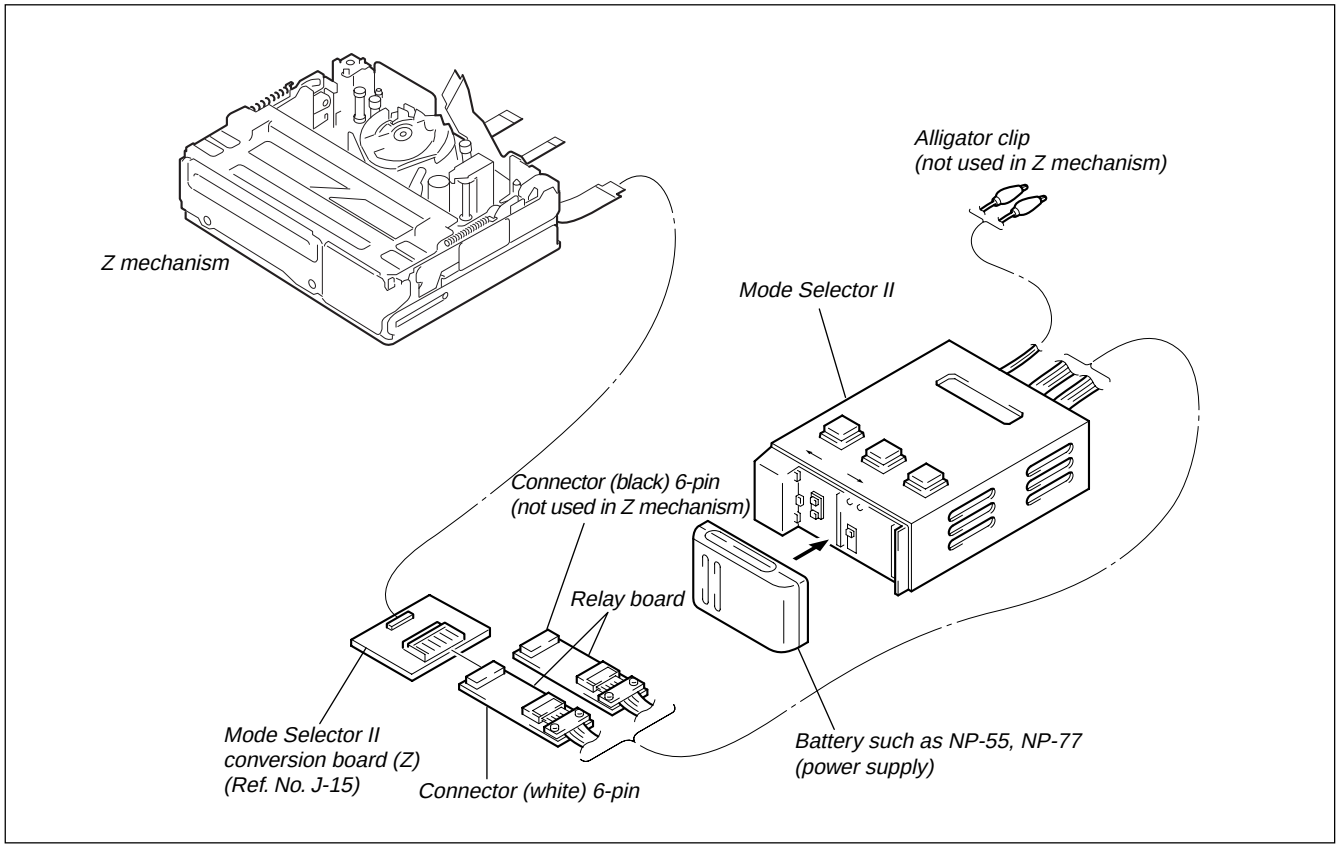
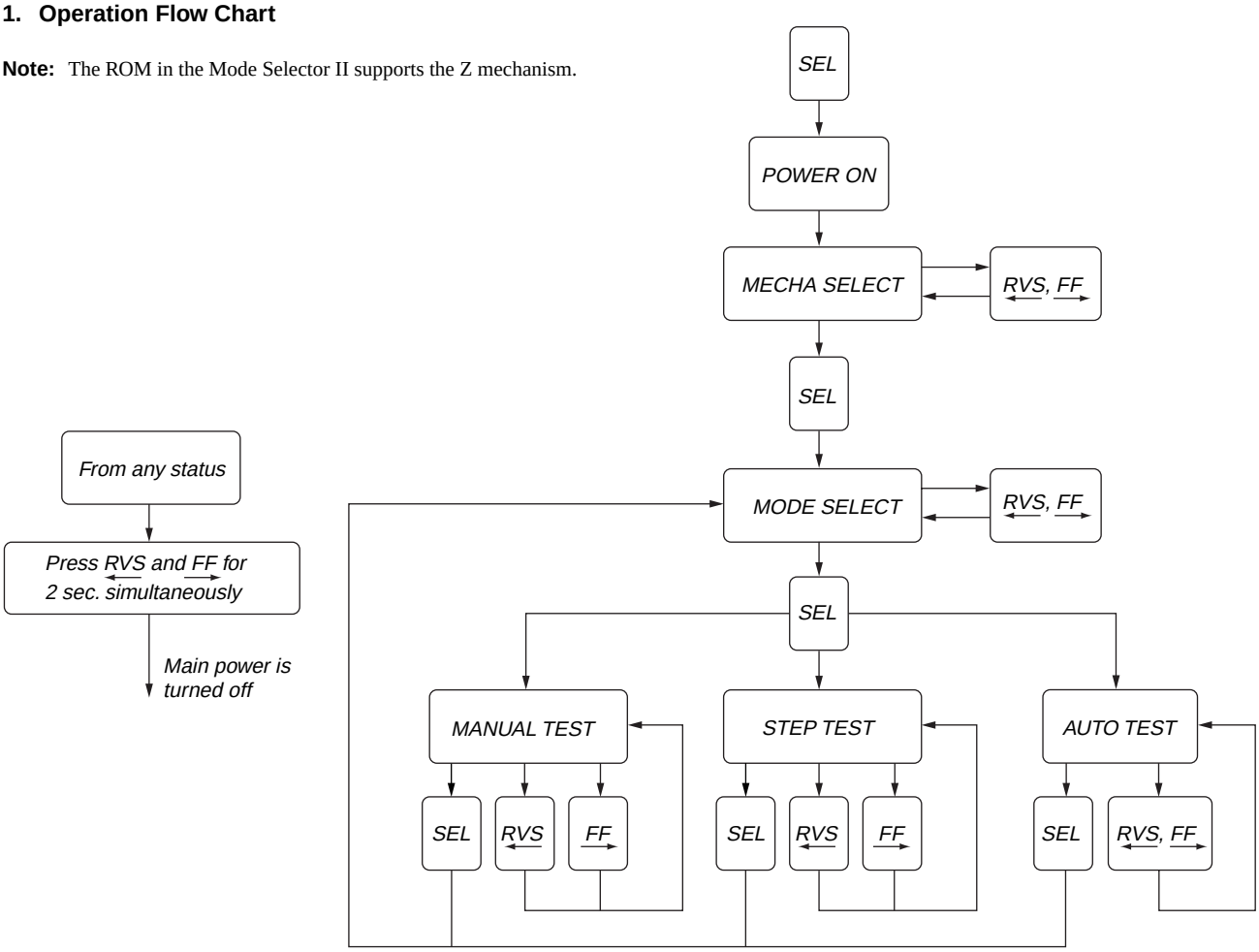


Fig. 2-4

2-5-2. Operation

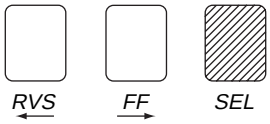
1. Operation Flow Chart

Note: The ROM in the Mode Selector II supports the Z mechanism.



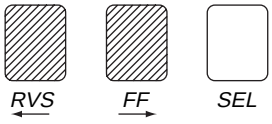
2. Mode Selector II Power On

Turn on the main power of the Mode Selector II as follows.
Press the SEL button.



3. Mode Selector II Power Off

Turn off the main power of the Mode Selector II as follows.
Press the RVS and FF buttons at the same time for 2 seconds or longer while the power is on.



4. Mecha Select

When the main power is turned on, the MECHA SELECT display appears on the LCD screen. Select the desired mechanism name using the RVS and FF buttons. Selection is complete when the SEL button is pressed. (Fig. A shows the Z mechanism.)

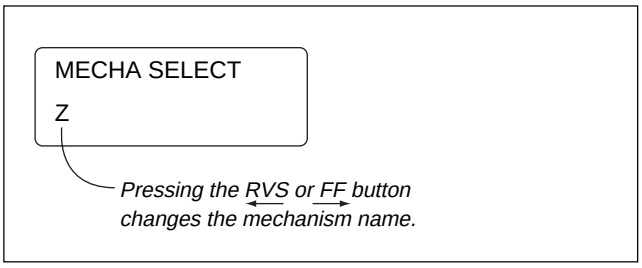


Fig. a

5. Test Type Select

Using the RVS and FF buttons, select a desired test type from the three types of "MANUAL", "STEP" and "AUTO". Selection is complete when the SEL button is pressed.

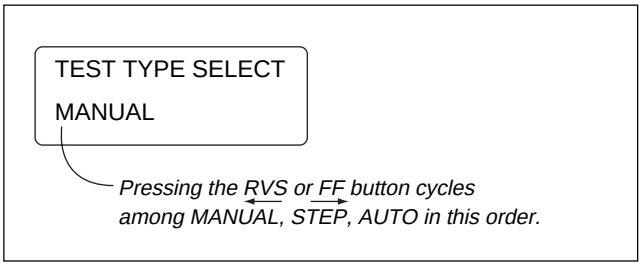


Fig. b

6. Manual Test

In this test, the motor of the mechanism deck is turned on only during the period while the RVS or FF button is pressed manually.

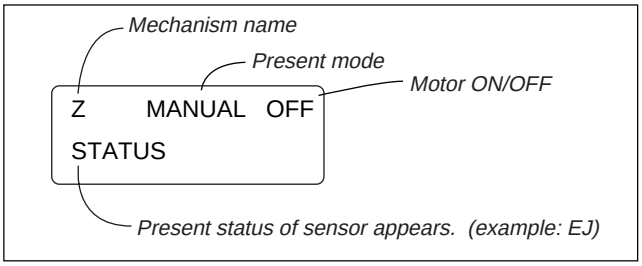


Fig. c

7. Step Test

In this test, the direction of motor movement is determined by the RVS and FF buttons. The motor of the mechanism deck is kept turned on until the mechanical status is changed from the present mechanical status that is obtained from the sensor information.

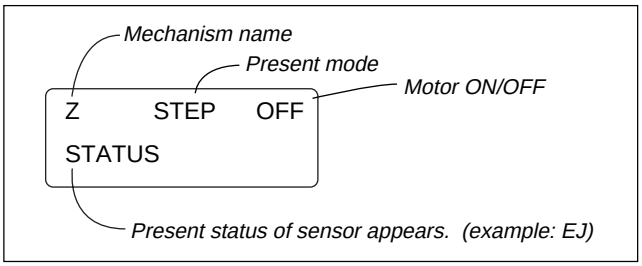


Fig. d

8. Auto Test

In this test, the mechanism deck is tested as to whether it performs a series of movements correctly in accordance with the operation sequence that is memorized earlier for each type of deck, by checking the output signals from sensors with the stored memory. Turning on the RVS or FF button performs the same operation.

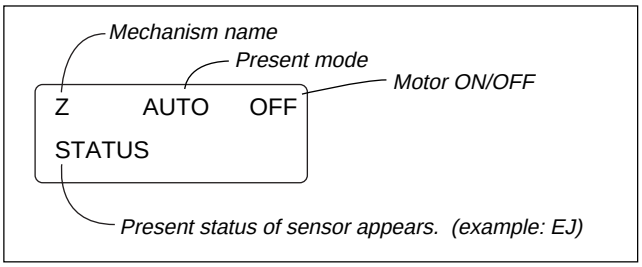


Fig. e

2-5-3. Mechanism Status (Position) Transition Table Using Mode Selector II

After selecting a mechanism deck, select either the MANUAL or STEP test (not AUTO) using the Mode Selector II. The desired mechanism status (position) can be specified by pressing the RVS or FF button. (The selected status appears on STATUS.)
EJ⟷ULE⟷SR⟷HL⟷STOP⟷R/P

MD name / Code				Z Mechanism
A	B	C		
0	1	0	1	EJ
1	1	0	2	ULE
1	0	0	3	SR
1	0	1	4	HL
0	0	1	5	STOP
0	1	1	6	R/P

2-5-4. Battery Alarm Indication

When the level of the battery used to supply power to this system decreases, this display appears asynchronously. When this happens, all operations are disabled and the battery must be replaced.

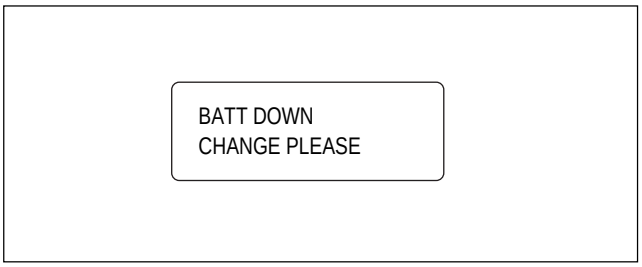
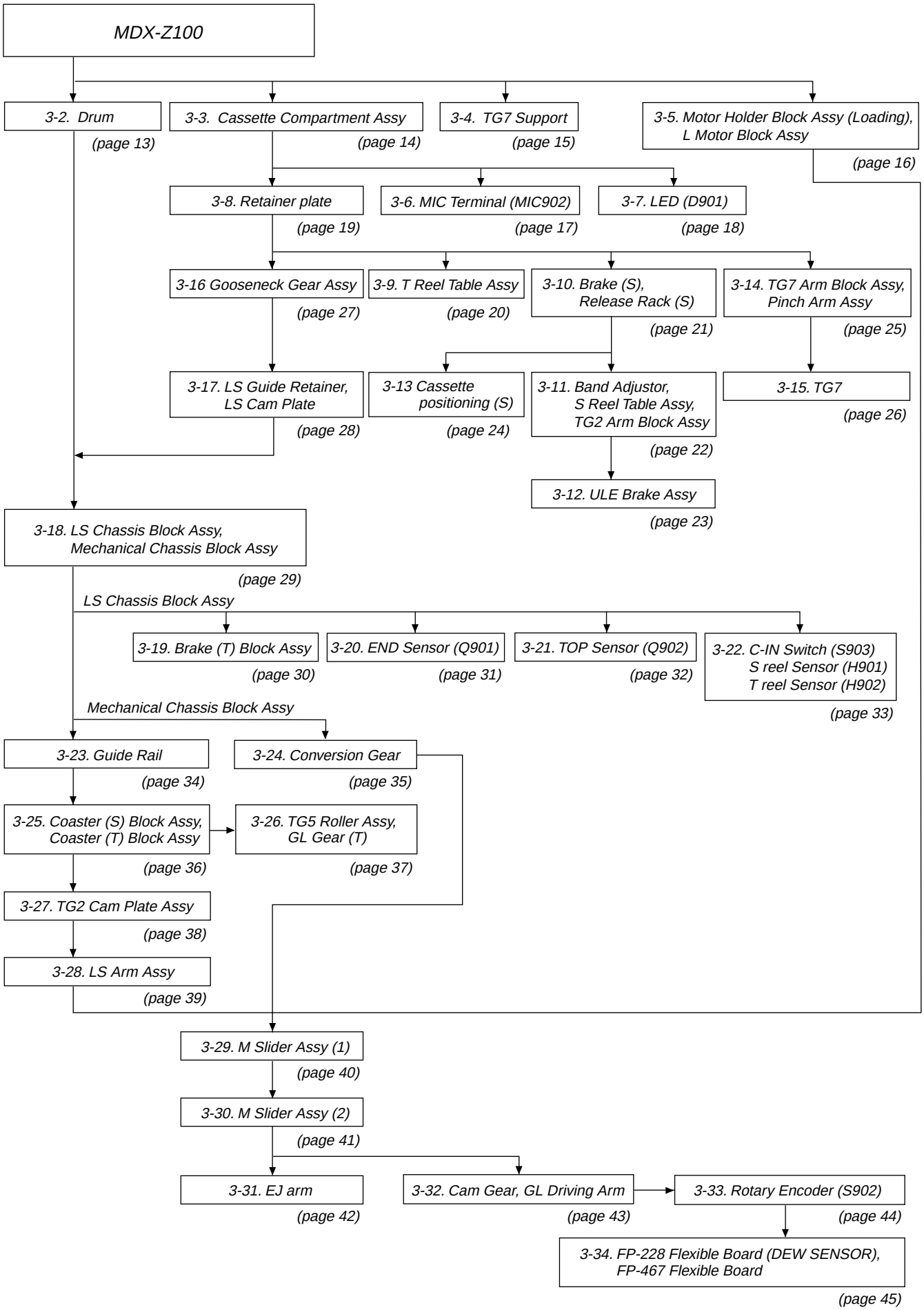


Fig. f

3. Check, Adjustment and Replacement of Mechanical Parts

3-1. Flowchart of Replacement of Mechanical Parts



3-2. Drum

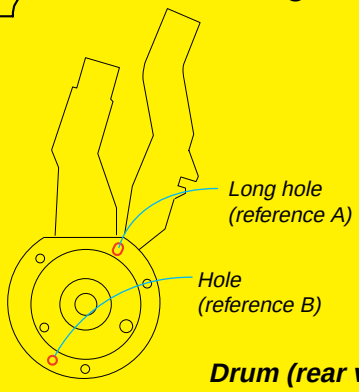
1. Removal procedure

1) Remove head drum flexible board Ⓒ from the notch of the mechanical chassis block assy.
2) Remove the drum fixing screw (M1.4 × 1.3) ① and remove the drum assy ②.

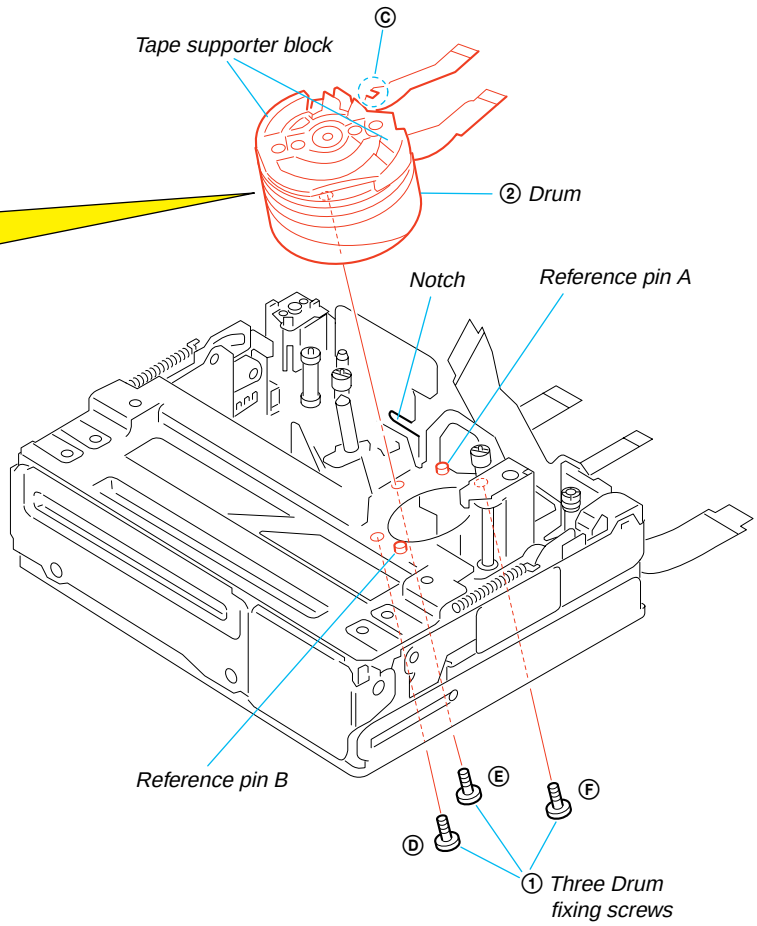
2. Attachment procedure

1) Ensure that head drum fixible board is hooked on the tape supporter block.
2) Hold the tape-supporter block of the drum ② and insert the drum flexible board into the mechanical chassis block assy.
3) Insert the two reference holes A and B of the drum into the reference pins A and B of the drum base assy.
4) Hook the flexible board Ⓒ portion on the notch.
5) Install the three drum fixing screws (M1.4 × 1.3) ① in the order starting from Ⓓ, then Ⓔ, and finally Ⓕ. Then tighten the screws.
   Tightening torque: 0.059 ± 0.01N•m (0.6 ± 0.1kgf•cm)
   Return Ⓔ 120°, then apply the screw locking paint (Neji lock).
6) Clean the drum by referring to section2-1.
7) Perform the tape path adjustment. (Refer to “4-4. Tape Path Adjustment”.)

Key Points in Re-assembling

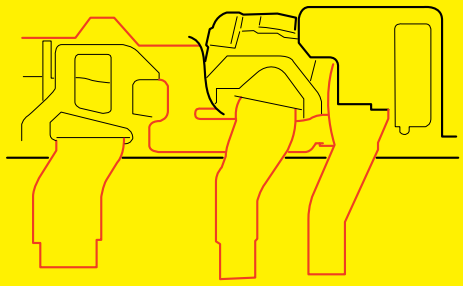


Drum (rear view)



Drum Flexible Board Processing

Key Points in Re-assembling



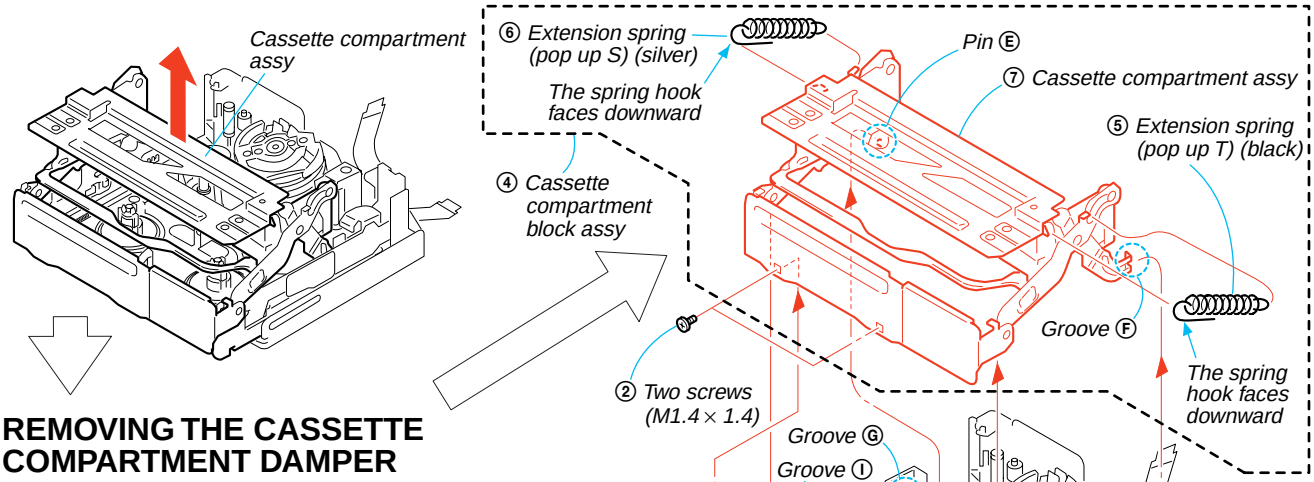
3-3. Cassette Compartment Assy

1. Removal procedure

1) Set the [EJ] mode.
2) Press the cassette compartment down halfway. Pull the cassette compartment damper ① in the direction of the arrow Ⓐ. Then rotate it in the Ⓑ direction, and remove it in the direction of Ⓒ.
3) Remove the two screws (special head screw M1.4 × 1.4) ②.
4) Remove the LS chassis block assy ③ in the direction of the arrow Ⓓ.
5) Remove the pin Ⓔ and groove Ⓕ of the cassette compartment assy ④ from the LS chassis groove Ⓖ and pin Ⓗ. Then remove the cassette compartment block assy ④.
6) Remove the tension spring (POP UP T) (black) ⑤.
7) Remove the tension spring (POP UP S) (silver) ⑥.Then remove the cassette compartment assy ⑦.

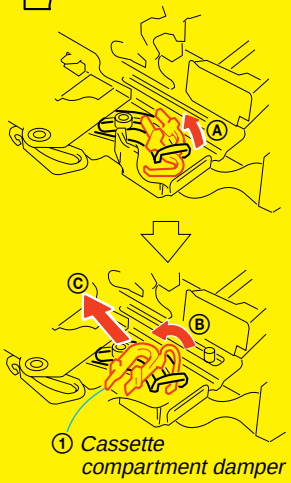
2. Attachment procedure

1) Set the [ULE] mode.
2) Install the tension spring (cassette compartment S) (POP UP S) (silver) ⑥ in to the cassette compartment assy ⑦. (The spring should be hooked on the front stay with the spring end facing upward.)
3) Install the tension spring (cassette compartment T) (POP UP T) (black) ⑤ in to the cassette compartment assy ⑦. (The spring should be hooked on the front stay with the spring end facing upward.)
4) Install the pin Ⓔ and groove Ⓕ of the cassette compartment assy ④ into the LS chassis groove Ⓖ and pin Ⓗ.
5) In the status that the LS block assy ③ is kept open, insert it into the grooves Ⓘ and Ⓙ of the LS chassis block assy.
6) Close the LS chassis block assy ③ in the direction opposite to the arrow Ⓓ, and install it with the two screws (special head screw M1.4 × 1.4) ②.
   Tightening torque: 0.059 ± 0.01N•m (0.6 ± 0.1kgf•cm)
7) The cassette compartment down halfway. Pass the Ⓚ portion of the cassette compartment damper ① through the groove at the tip of the cassette compartment. Then pull the Ⓛ portion and fix it using tweezers or something.

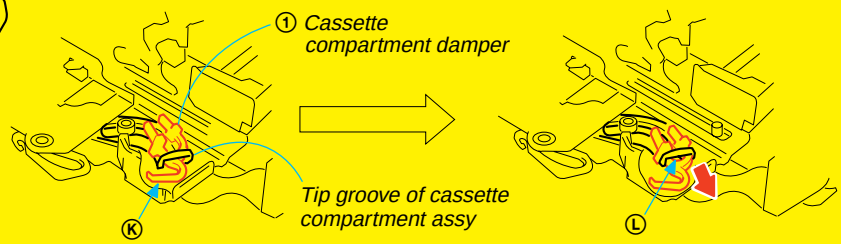


REMOVING THE CASSETTE COMPARTMENT DAMPER

Points to be noted



Key Points in Re-assembling



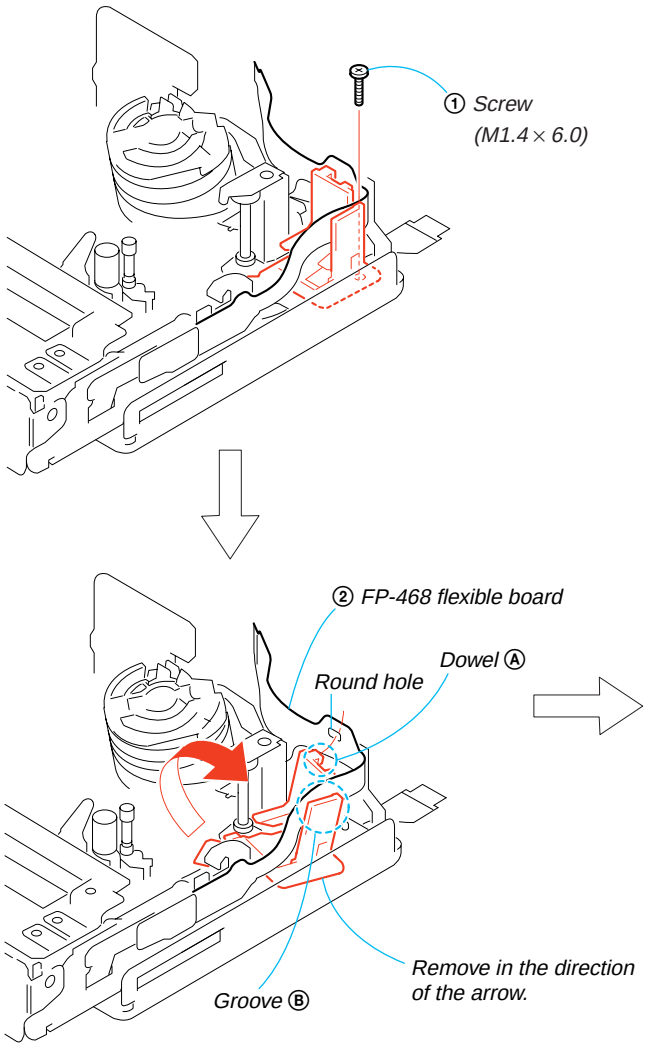
3-4. TG7 Support

1. Removal procedure

1) Remove the screw (special head screw M1.4 × 6.0) ①.
2) Remove the FP-468 flexible board ② from the dowel Ⓐ of the TG7 support.
3) Remove the FP-468 flexible board ② from the groove Ⓑ of the TG7 support.
4) Remove the TG7 support ③ in the direction of the arrow.

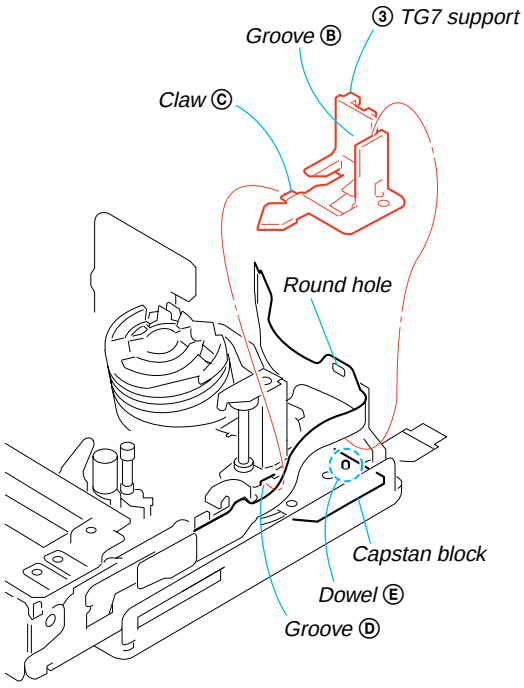
2. Attachment procedure

1) Install the FP-468 flexible board ② into the groove Ⓑ of TG7 support ③.
2) Insert the claw Ⓒ of the TG7 support ③ into the groove Ⓓ of the capstan block, and fix it while aligning with the dowel Ⓔ.
3) Align the round hole of the FP-468 flexible board ② with the dowel Ⓐ of the TG7 support ③.
4) Install the screw (special head screw M1.4 × 6.0) ①.
Tightening torque: 0.059 ± 0.01N•m (0.6 ± 0.1kgf•cm)



Points to be noted

• Be careful not to damage the FP-468 flexible board.



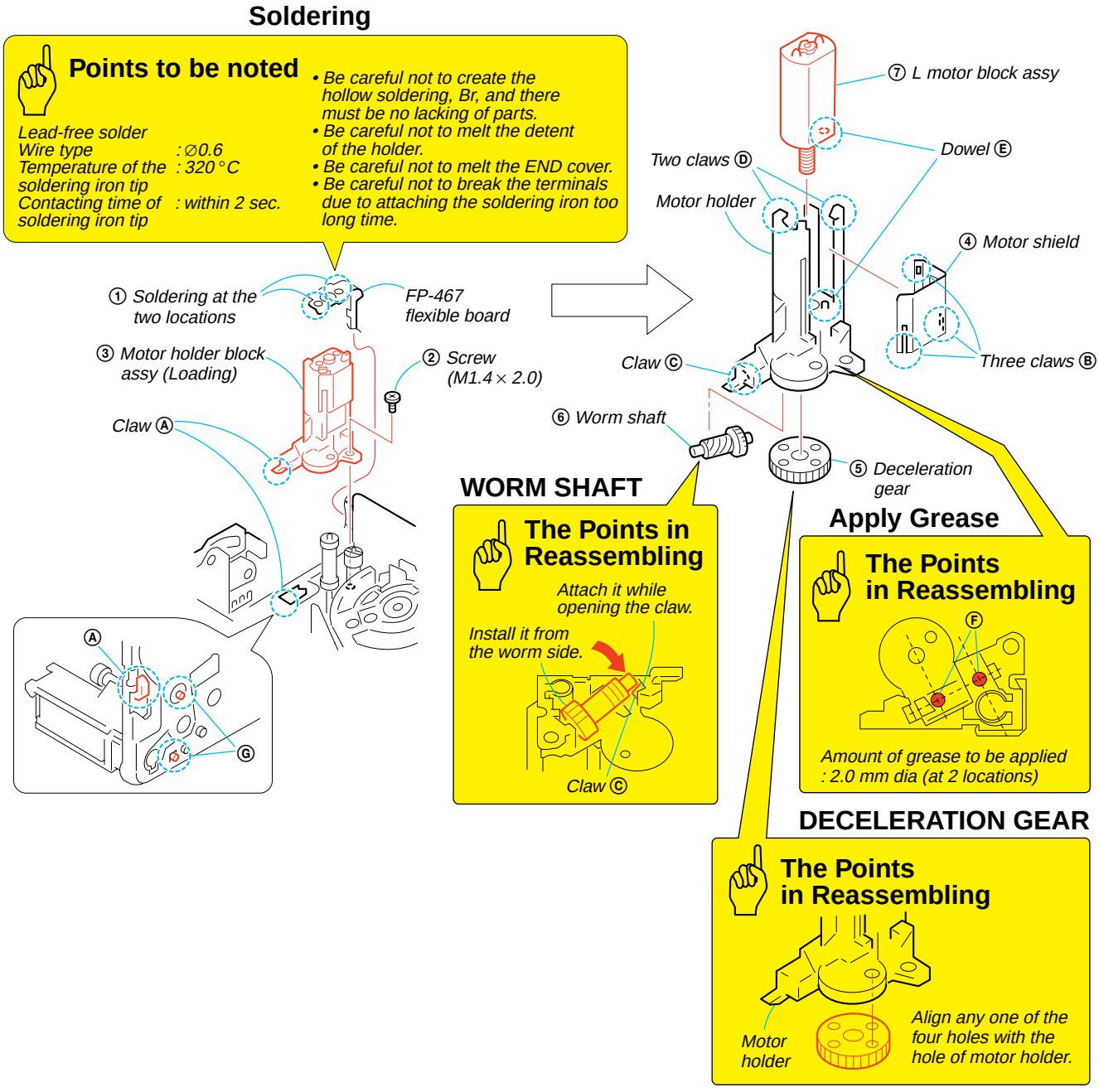
3-5. Motor Holder Block Assy and L Motor Block Assy

1. Removal procedure

1) Remove soldering at the two locations ①, and remove the FP-467 flexible board from the motor holder block assy (loading) ③.
2) Remove the screw (special head screw M1.4 × 2.0) ②.
3) Remove the motor holder block assy (loading) ③ by pulling it off from the claw Ⓐ.
4) Release the three claws Ⓑ and remove the motor shield ④.
5) Remove the deceleration gear ⑤.
6) Release the claw Ⓒ and remove the worm shaft ⑥.
7) Release the two claws Ⓓ and remove the L motor block assy ⑦ from the motor holder.

2. Attachment procedure

1) Confirm the direction of the L motor block assy ⑦. Align the dowels Ⓔ then install into the motor holder. (Insert the motor worm so that the motor worm does not touch the motor holder, and fix it with two claws Ⓓ.
2) Engage the three claws Ⓑ and install the motor shield.
3) Apply 2.0 g of grease (at 2 locations) to the bottom Ⓕ of the motor holder.
4) Install the worm shaft ⑥ from the worm side and set the claw.
5) Install the reduction gear ⑤.
6) Engage the claw Ⓐ and align the two dowels Ⓖ. Then install the motor holder block assy (loading) ③ in the mechanical chassis block. Install the screw (special head screw M1.4 × 2.0) ②.
   Tightening torque: 0.059 ± 0.01N•m (0.6 ± 0.1kgf•cm)
7) Make soldering at the two locations ①. Install the motor holder block assy (loading) ③ into the FP-467 flexible board ④.


Soldering
Points to be noted
Lead-free solder
Wire type : ∅0.6
Temperature of the soldering iron tip : 320 °C
Contacting time of soldering iron tip : within 2 sec.
• Be careful not to create the hollow soldering, Br, and there must be no lacking of parts.
• Be careful not to melt the detent of the holder.
• Be careful not to melt the END cover.
• Be careful not to break the terminals due to attaching the soldering iron too long time.
① Soldering at the two locations
FP-467 flexible board
③ Motor holder block assy (Loading)
② Screw (M1.4 × 2.0)
Claw Ⓐ
Ⓐ
Ⓖ
⑦ L motor block assy
Two claws Ⓓ
Dowel Ⓔ
Motor holder
④ Motor shield
Three claws Ⓑ
Claw Ⓒ
⑥ Worm shaft
⑤ Deceleration gear
WORM SHAFT
The Points in Reassembling
Attach it while opening the claw.
Install it from the worm side.
Claw Ⓒ
Apply Grease
The Points in Reassembling
Ⓕ
Amount of grease to be applied : 2.0 mm dia (at 2 locations)
DECELERATION GEAR
The Points in Reassembling
Motor holder
Align any one of the four holes with the hole of motor holder.

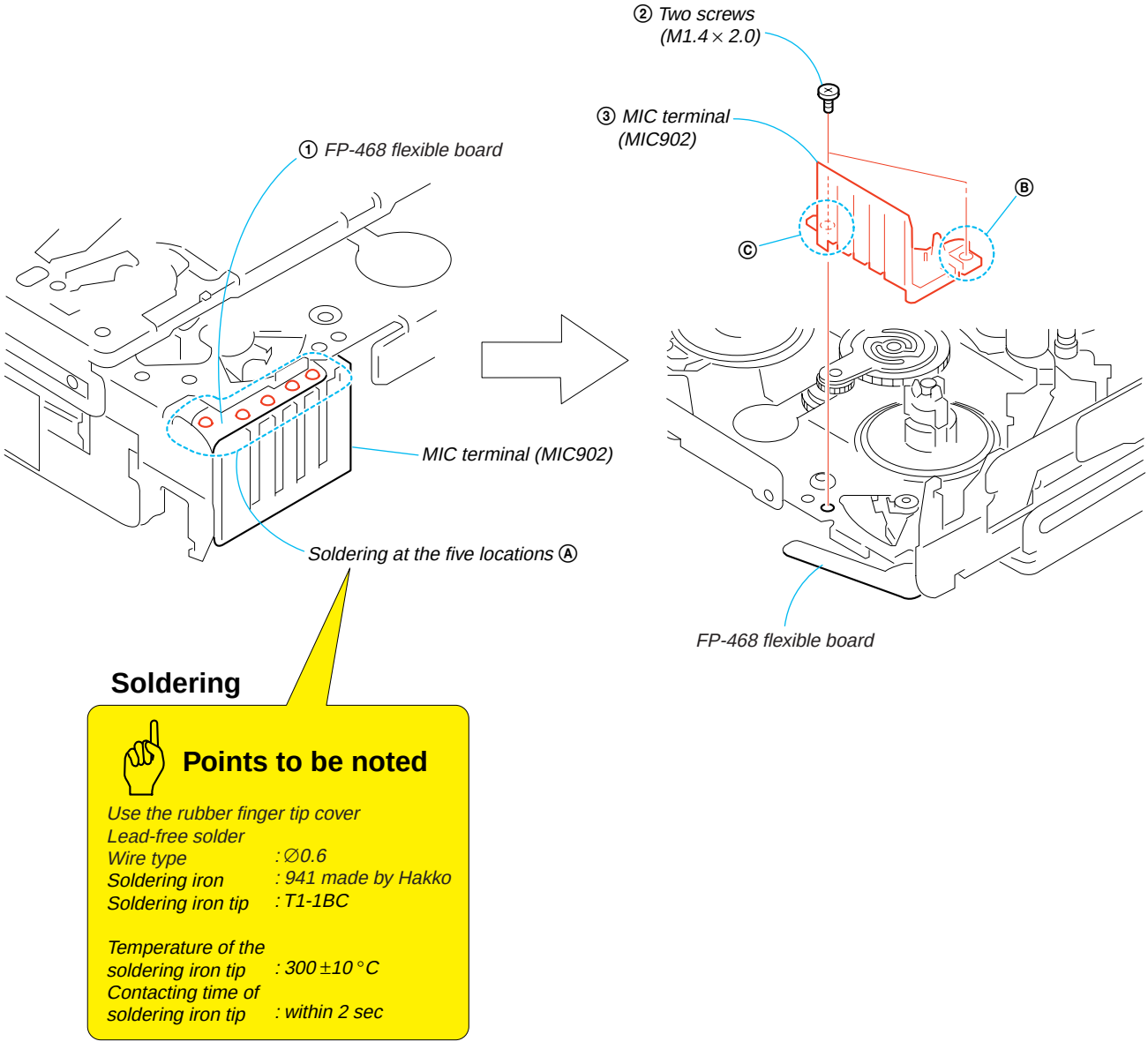
3-6. MIC Terminal (MIC902)

1. Removal procedure

1) Remove soldering at the five locations Ⓐ, and remove the FP-467 flexible board ① from the MIC terminal (MIC902) ③.
2) Remove the screw (special head screw M1.4 × 2.0) ② and remove the MIC terminal (MIC902) ③.

2. Attachment procedure

1) While pressing the top of the MIC terminal (MIC902) ③, tighten the two screws (special head screw M1.4 × 2.0) ② in the order of Ⓑ then Ⓒ.
   Tightening torque: 0.059 ± 0.01N•m (0.6 ± 0.1kgf•cm)
2) Make soldering at the five locations Ⓐ, and connect the FP-468 flexible board ① into the MIC terminal (MIC902) .



Soldering

Points to be noted

Use the rubber finger tip cover
Lead-free solder

Wire type	*: ∅0.6*
Soldering iron	*: 941 made by Hakko*
Soldering iron tip	*: T1-1BC*
Temperature of the soldering iron tip	*: 300 ±10 °C*
Contacting time of soldering iron tip	*: within 2 sec*

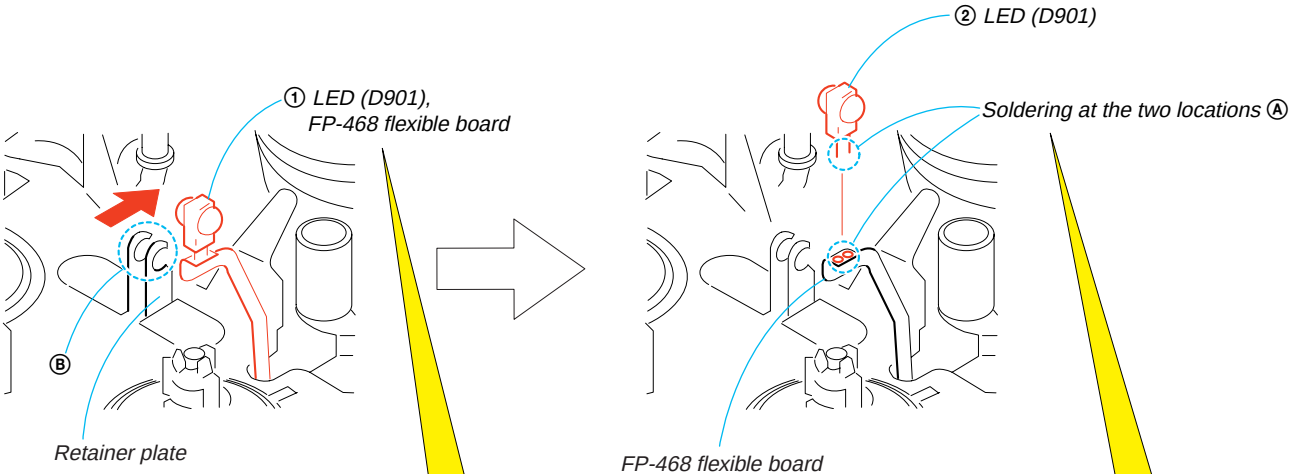
3-7. LED (D901)

1. Removal procedure

1) Remove LED (D901) and the FP-468 flexible board ① from the retainer plate.
2) Remove soldering at the two locations Ⓐ and remove LED (D901) ②.

2. Attachment procedure

1) Install the LED (D901) ② to the FP-468 flexible board by making soldering at the two locations Ⓐ.
2) Fold the FP-468 flexible board ① beneath the LED (D901) with finger tip so that it is inserted into the Ⓑ portion of the retainer plate.



LED (D901), FP-468 FLEXIBLE BOARD

Points to be noted

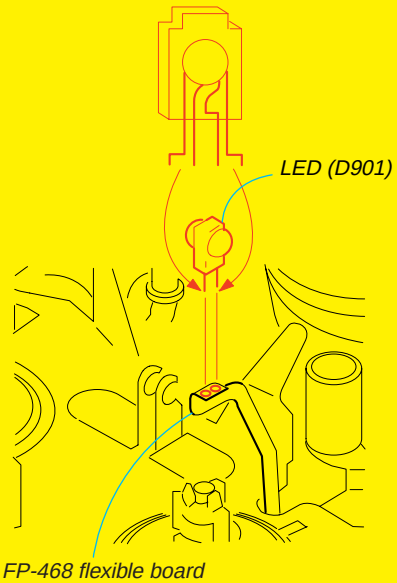
- *There must be no solder crack.*
- *There must be no scars and no stains.*
- *The flexible board must have no breakdown.*
- *The retainer plate and LED block must have no deformation.*

Soldering

Points to be noted

Rubber finger tip protection cover must be used.
Lead-free solder
Wire type: diameter ∅0.6
Soldering iron: 941 made by Hakko
Soldering iron tip: T1-1BC
Temperature of the soldering iron tip: 300 ±10 °C
Contacting time of soldering iron tip: within 2 sec.

Direction of the terminal is specified.



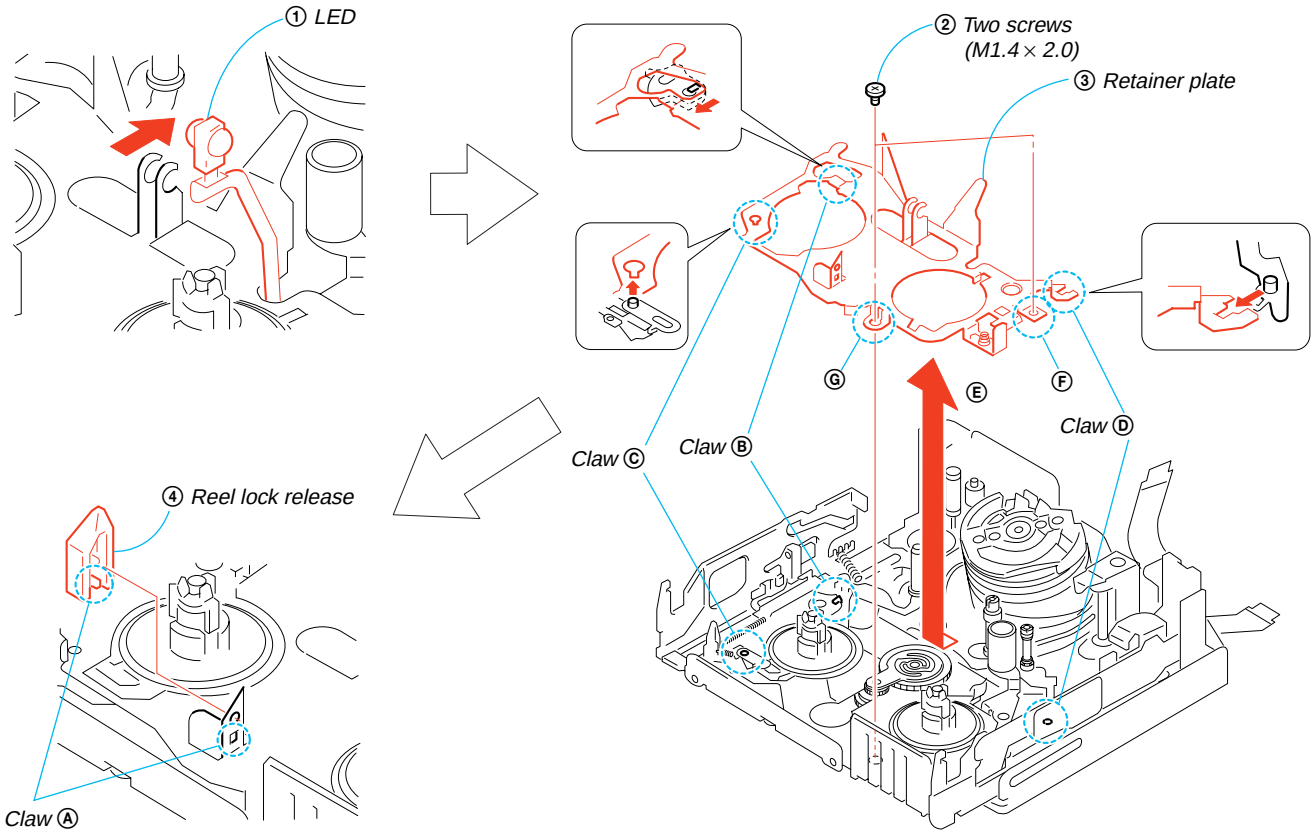
3-8. Retainer Plate

1. Removal procedure

1) Remove LED ① from the retainer plate.
2) Remove the two screws (special head screw M1.4 × 2.0) ②.
3) Release the three claws Ⓑ, Ⓒ and Ⓓ, and remove the retainer plate ③ in the direction of the arrow mark Ⓔ.
4) Release the claw Ⓐ and remove the reel lock release ④.

2. Attachment procedure

1) Install the reel lock release ④.
2) Place the retainer plate ③ on top of the LS chassis block assy and engage the three claws in the order starting from Ⓓ, Ⓒ and Ⓑ.
3) Install the two screws (special head screw M1.4 × 2.0) ② in the order starting from Ⓕ then Ⓖ.
   Tightening torque: 0.059 ± 0.01N•m (0.6 ± 0.1kgf•cm)
4) Install LED ① to the retainer plate.



REEL LOCK RELEASE

Key Points in Re-assembling

- *The reel lock release should not be re-used.*
- *The retainer plate must not have any deformation.*
- *The reel lock release should be fully installed. (Should not be left in the half-installed state.)*

RETAINER PLATE

Key Points in Re-assembling

- *All claws must be fully engaged. (Caution : No claws should be left disengaged.)*
- *The flexible board should not be pinched by anything.*
- *The retainer plate must not touch with the MIC terminal.*

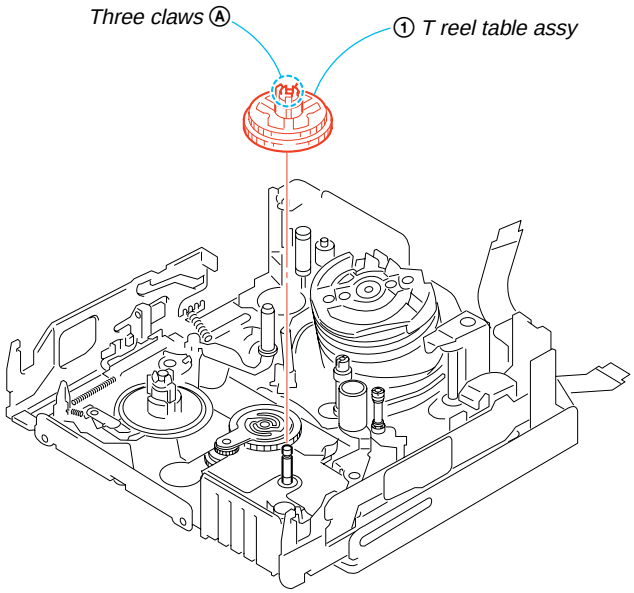
3-9. T Reel Table Assy

1. Removal procedure

1) Remove the T reel table assy ①, averting three claws Ⓐ.

2. Attachment procedure

1) Confirm that the supplied part is really the T reel table assy ①. Insert the T reel table assy ① into the T reel shaft. Install the T reel table assy ① and lock it at the position where you can hear the snapping sound. You can find the locking position by rotating the T reel table assy ①.



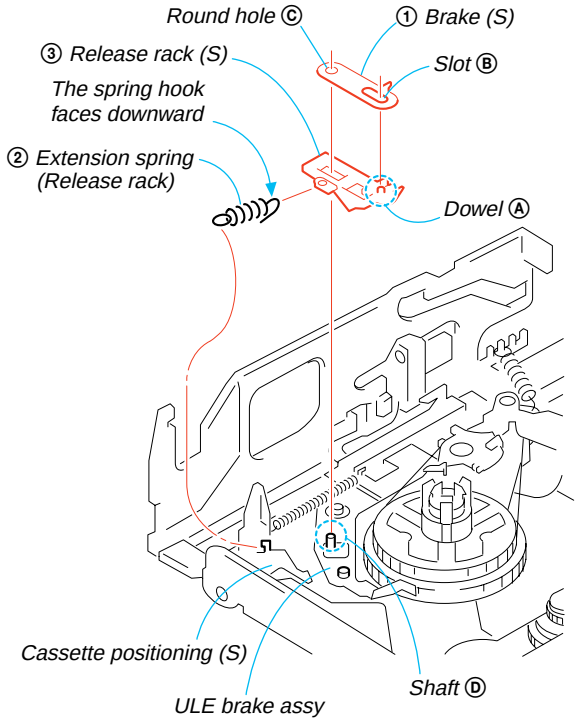
3-10. Brake (S) and Release Rack (S)

1. Removal procedure

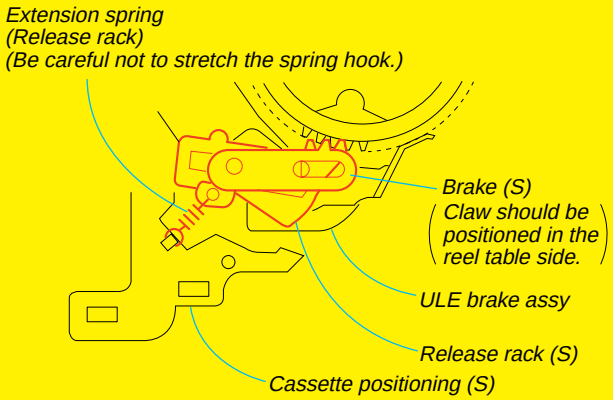
1) Remove the brake (S) ①.
2) Remove the tension spring (release rack (S)) ②.
3) Remove the release rack (S) ③.

2. Attachment procedure

1) Remove the release rack (S) ③ by holding it with a ultra precision tweezers. Install the tension spring (release rack) ② while being careful of the installation direction of the tension spring.
2) Hook the tension spring (release rack) ② on the hook of the cassette positioning (S), and then install it in the ULE brake assy.
3) Insert the slot Ⓑ in the dowel Ⓐ of the release rack (S) ③. Insert the round hole Ⓒ into the pivot shaft Ⓓ and install the brake (S) ①.
(Installation direction: Claw should be positioned in the reel table side.)



Key Points in Re-assembling


Extension spring (Release rack) (Be careful not to stretch the spring hook.)
Brake (S) Claw should be positioned in the reel table side.
ULE brake assy
Release rack (S)
Cassette positioning (S)

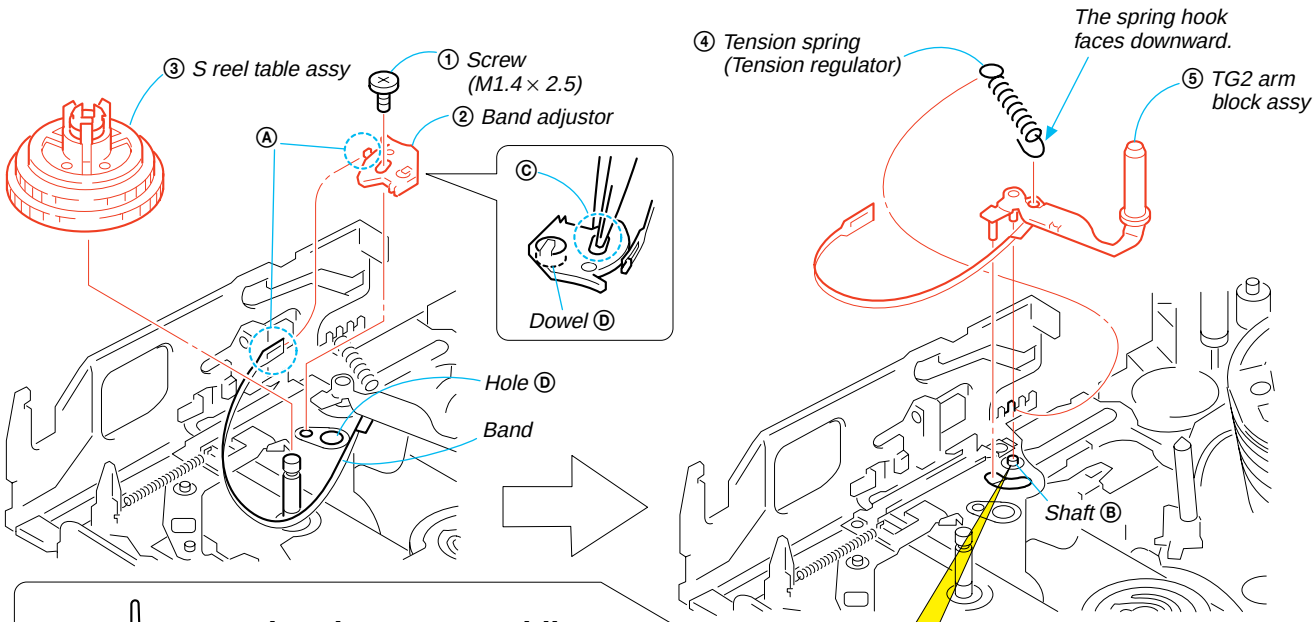
3-11. Band Adjuster, S Reel Table Assy and TG2 Arm Block Assy

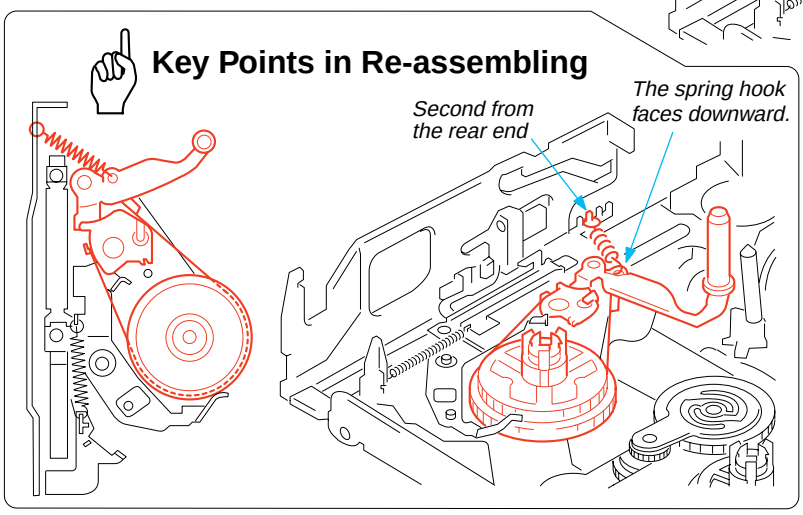
1. Removal procedure

1) Remove the screw (special head screw M1.4 × 2.5) ①.
2) Remove the band Ⓐ of the TG2 arm block and remove the band adjuster ②.
3) Remove the S reel table assy ③.
4) Remove the tension spring (tension regulator spring) ④.
5) Remove the TG2 arm block assy ⑤.

2. Attachment procedure

1) Install the S reel table assy ③.
2) Apply grease in the TG2 arm pivot shaft Ⓑ.
   Amount of grease: a ball of 1.0 mm diameter of grease
   Re-application of grease to the point which is greased already before is not necessary.
3) Hold the TG2 arm block assy ⑤ with tweezers and insert it in the TG2 arm pivot shaft Ⓑ.
4) Hook the tension spring (tension regulator spring) ④ on the TG2 arm block ⑤ with tweezers so that the hook faces downward.
5) Hook the tension spring (tension regulator spring) ④ on the LS chassis block assy (the second hook from the rear end).
6) Hook the Ⓐ portion of the band on the claw of the band adjuster ②.
7) Hold the band adjuster with tweezers as shown in Ⓒ. Insert the band into groove of the S reel table assy while rotating it, and insert the adjuster's dowel into the dowel hole Ⓓ of the LS chassis block assy.
8) Install the band adjuster ② with the screw (special head screw M1.4 × 2.5) ①.
   Tightening torque: 0.059 ± 0.01N•m (0.6 ± 0.1kgf•cm)
9) Perform the TG2 FWD Position Adjustment referring to section 4-1.
10) Perform the FWD Back-tension Adjustment referring to section 4-4.
11) Perform the Reel Torque Check referring to section 4-2.

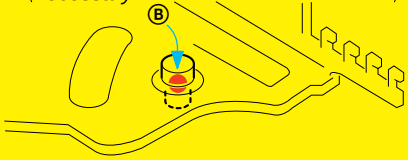




Apply Grease

Points to be noted

During installation, apply grease in the TG2 arm pivot shaft hole.
Amount of grease:
a ball of grease of 1.0 mm diameter
Re-application of grease to the point which is greased already before is not necessary.



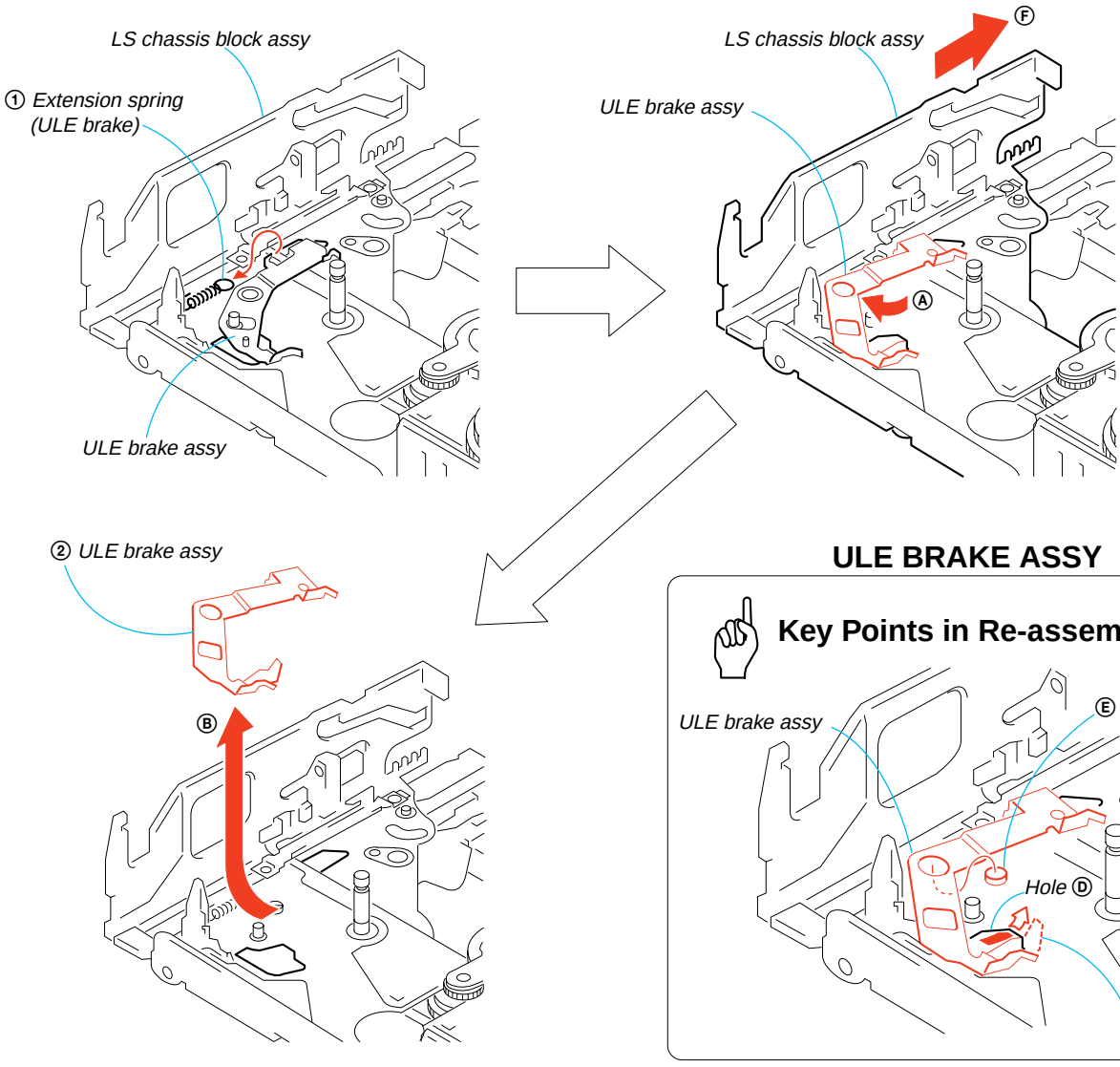
3-12. ULE Brake Assy

1. Removal procedure

1) Remove the tension spring (ULE brake) ① from the ULE brake assy ②.
2) Slide the LS chassis block assy slightly in the direction of the arrow Ⓕ.
3) Slant the ULE brake assy ② in the direction of the arrow Ⓐ and remove it by sliding it in the direction of Ⓑ.

2. Attachment procedure

1) Confirm the front side and the rear side of the ULE brake assy ②. Hold it correctly with tweezers. Insert the portion Ⓒ into the hole Ⓓ of the LS chassis block assy and install the center hole in the Ⓔ of the chassis.
2) Install the tension spring (ULE brake assy) ①.



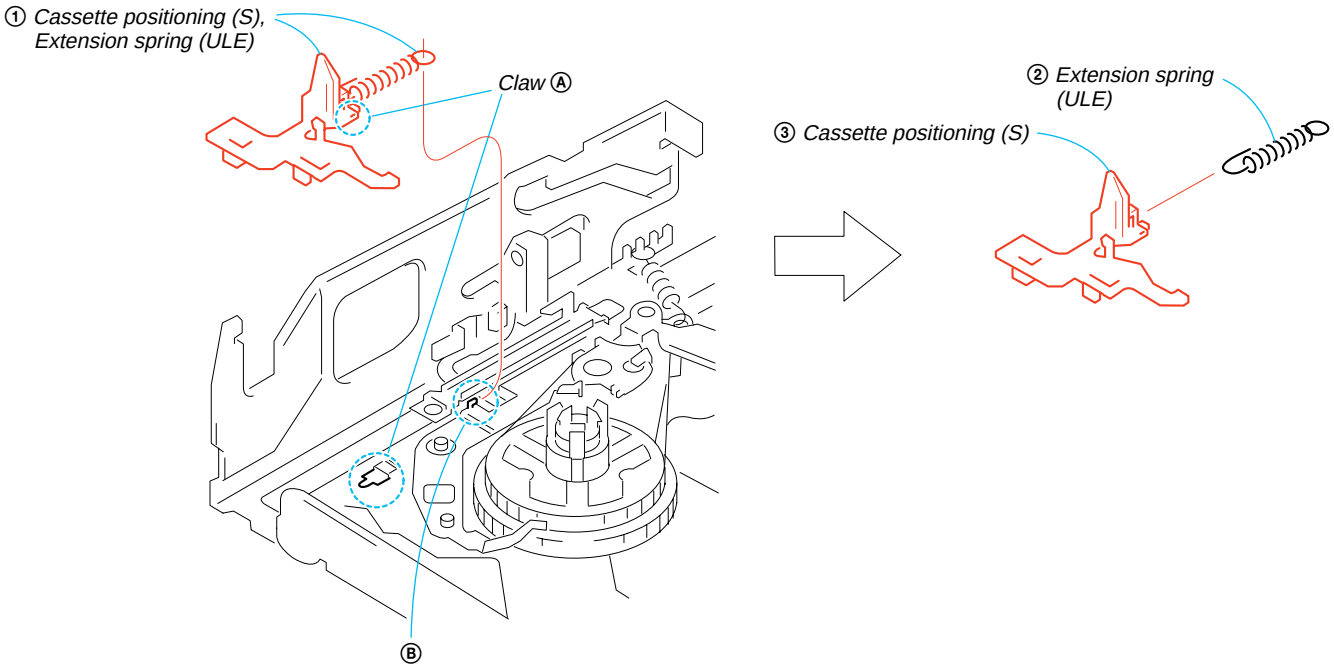
3-13. Cassette Positioning (S)

1. Removal procedure

1) Remove the tention spring (ULE brake) ② from the hook Ⓑ of ULE brake assy.
2) Slide the cassette positioning (S), then remove the cassette positioning (S) and tension spring (ULE brake) ① all together at the same time.
3) Remove the tension spring (ULE brake) ② from the cassette positioning (S) ③.

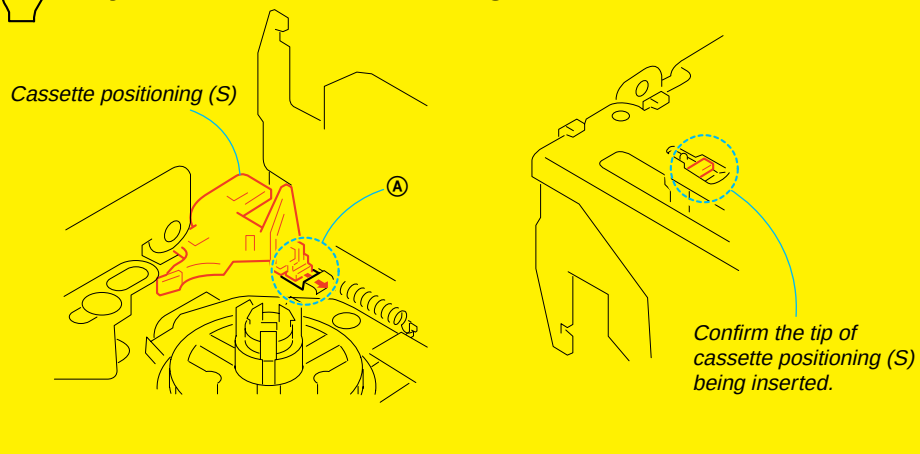
2. Attachment procedure

1) Hook the tension spring (ULE brake) ② on the cassette positioning (S) ③ with tweezers.
2) Hold the cassette positioning (S) ③ with tweezers and insert the top tip of the claw into the LS chassis block assy Ⓐ. Lock it by sliding it in.
3) Install the other end of the tension spring (ULE brake) ② on the hook Ⓑ.



CASSETTE POSITIONING (S)

Key Points in Re-assembling



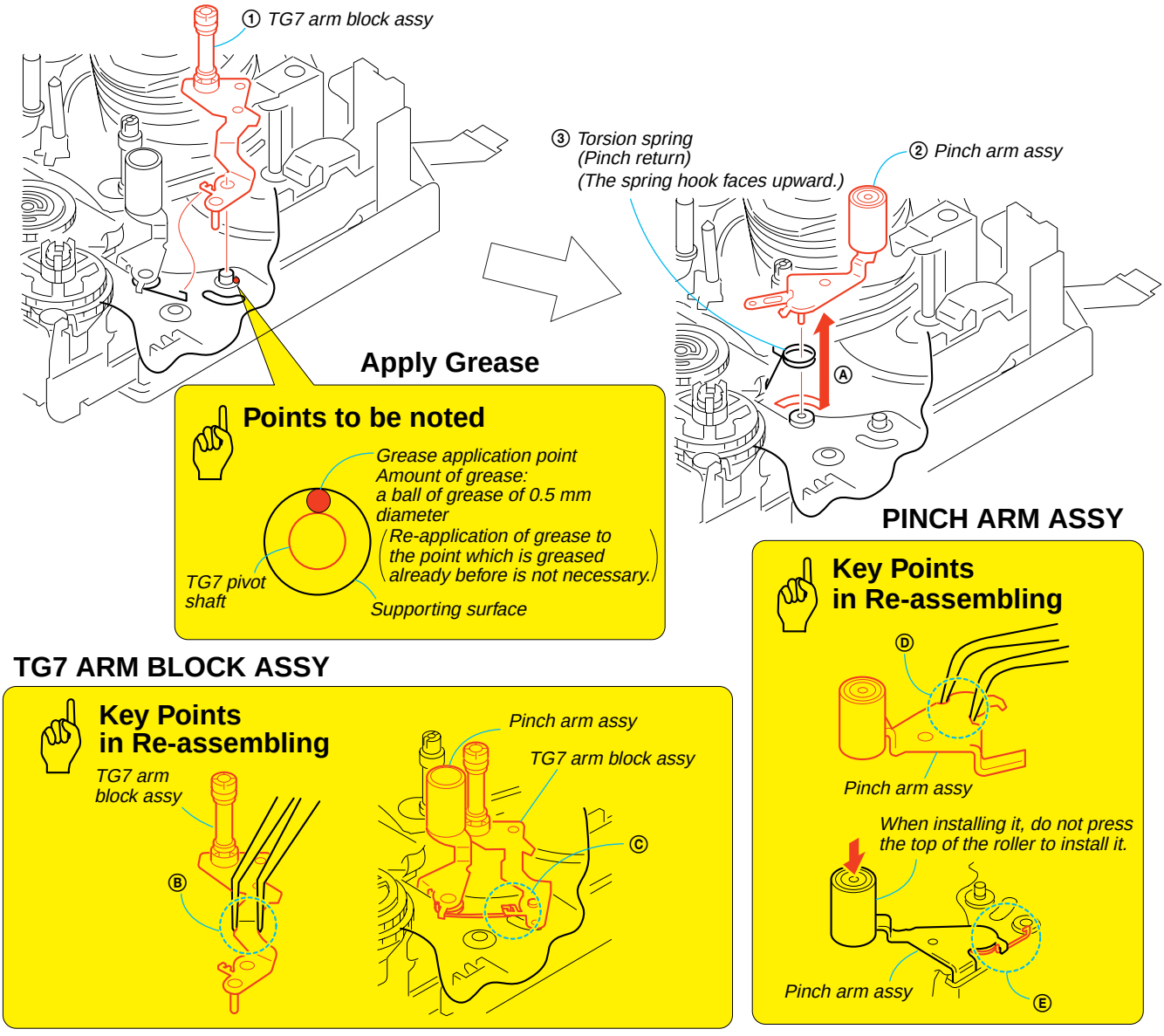
3-14. TG7 Arm Block Assy and Pinch Arm Assy

1. Removal procedure

1) Remove the TG7 arm block assy ①.
2) Rotate the pinch arm assy ② in the direction of the arrow Ⓐ and remove it.
3) Remove the torsion spring (pinch return) ③.

2. Attachment procedure

1) Hold the torsion spring (pinch return) ③ with tweezers. Confirm that the hook faces upward and install it in the bearing.
2) Hold the pinch arm assy ② as shown in Ⓓ and install it in the pinch arm bearing.
3) Hold the torsion coil spring (pinch return) ③ with tweezers and install it as shown in Ⓔ.
4) Apply grease on the supporting surface of the TG7 pivot shaft.
   Amount of grease: a ball of grease of 0.5 mm diamte
   Re-application of grease to the point which is greased already before is not necessary.
5) Hold the TG7 arm block assy ① as shown in Ⓑ and insert it in the pivot shaft of the TG7 arm.
6) Hold the torsion spring (pinch return) ③ with tweezers and install it on the hook of the TG7 arm block assy ① as shown in Ⓒ.
7) Confirm that the torsion spring (pinch return) ③ does not override on the pinch supporting shaft.



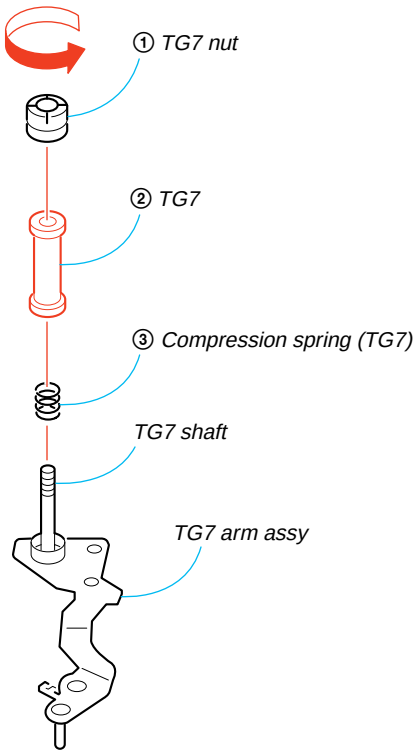
3-15. TG7

1. Removal procedure

1) Remove the TG7 nut ① by turning it in the direction of the arrow.
2) Remove the TG7 ② and compression coil spring ③ from the TG7 arm block assy.

2. Attachment procedure

1) Install the compression coil spring ③ and TG7 ② in the TG7 shaft of the TG7 arm block assy.
2) Install the TG7 nut ① by turning it in the opposite direction of the arrow.



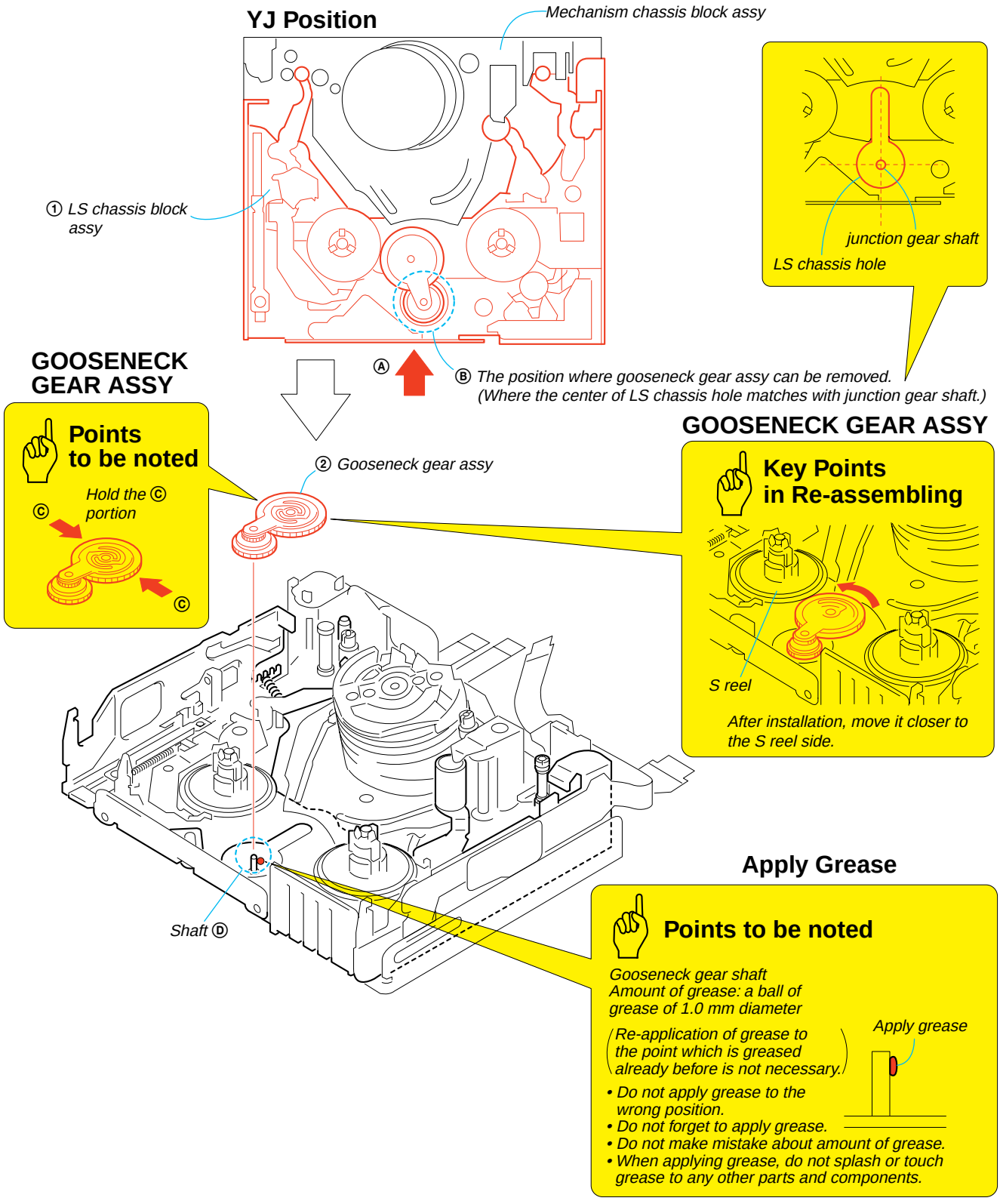
3-16. Gooseneck Gear Assy

1. Removal procedure

1) Move the LS chassis block assy ① in the direction of the arrow Ⓐ to make it in YJ position.
   YJ position: The position Ⓑ where gooseneck gear assy can be removed. (where the center of LS chassis hole matches with junction gear shaft.)
2) Remove the gooseneck gear assy, holding it with Ⓒ.

2. Attachment procedure

1) Apply grease to the gooseneck gear shaft Ⓓ portion.
   Amount of grease: a ball of grease of 1.0 mm diameter
   Need no re-application to one which applied already.
2) Install the gooseneck gear assy, holding it with Ⓒ in the gooseneck gear shaft.
3) Move it closer to the S reel.


YJ Position
Mechanism chassis block assy
① LS chassis block assy
junction gear shaft
LS chassis hole
Ⓐ
Ⓑ The position where gooseneck gear assy can be removed.
(Where the center of LS chassis hole matches with junction gear shaft.)
GOOSENECK GEAR ASSY
Points to be noted
Hold the Ⓒ portion
Ⓒ
Ⓒ
② Gooseneck gear assy
GOOSENECK GEAR ASSY
Key Points in Re-assembling
S reel
After installation, move it closer to the S reel side.
Shaft Ⓓ
Apply Grease
Points to be noted
Gooseneck gear shaft
Amount of grease: a ball of grease of 1.0 mm diameter
Re-application of grease to the point which is greased already before is not necessary.
Apply grease
• Do not apply grease to the wrong position.
• Do not forget to apply grease.
• Do not make mistake about amount of grease.
• When applying grease, do not splash or touch grease to any other parts and components.

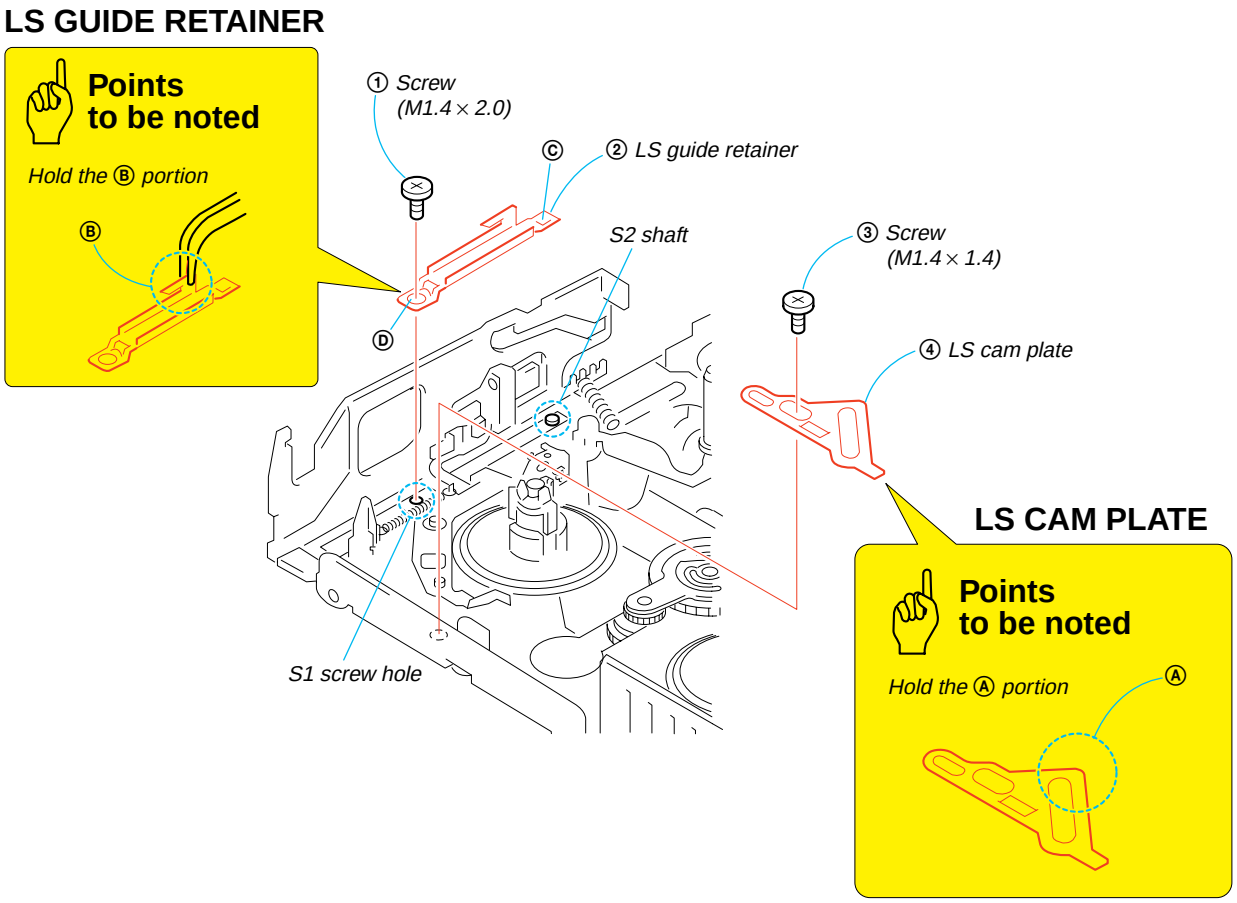
3-17. LS Guide Retainer and LS Cam Plate

1. Removal procedure

1) Remove the screw (special head screw M1.4 × 2.0) ①. and remove the LS guide retainer ②.
2) Remove the screw (special head screw M1.4 × 1.4) ③ and remove the LS cam plate ④.

2. Attachment procedure

1) Hold the LS cam plate with Ⓐ and place it aligning the two dowels. Tighten the screw (special head screw M1.4 × 1.4) ③ in half way.
2) Adjust the LS cam plate by referring to section 4-5.
3) Hold the LS guide retainer ② with Ⓑ and hook its key hole Ⓒ on the S2 shaft, and align the hole Ⓓ to S1 screw hole.
4) Install the screw (special head screw M1.4 × 2.0) ① in the S1 screw hole.
   Tightening torque: 0.059 ± 0.01N•m (0.6 ± 0.1kgf•cm)



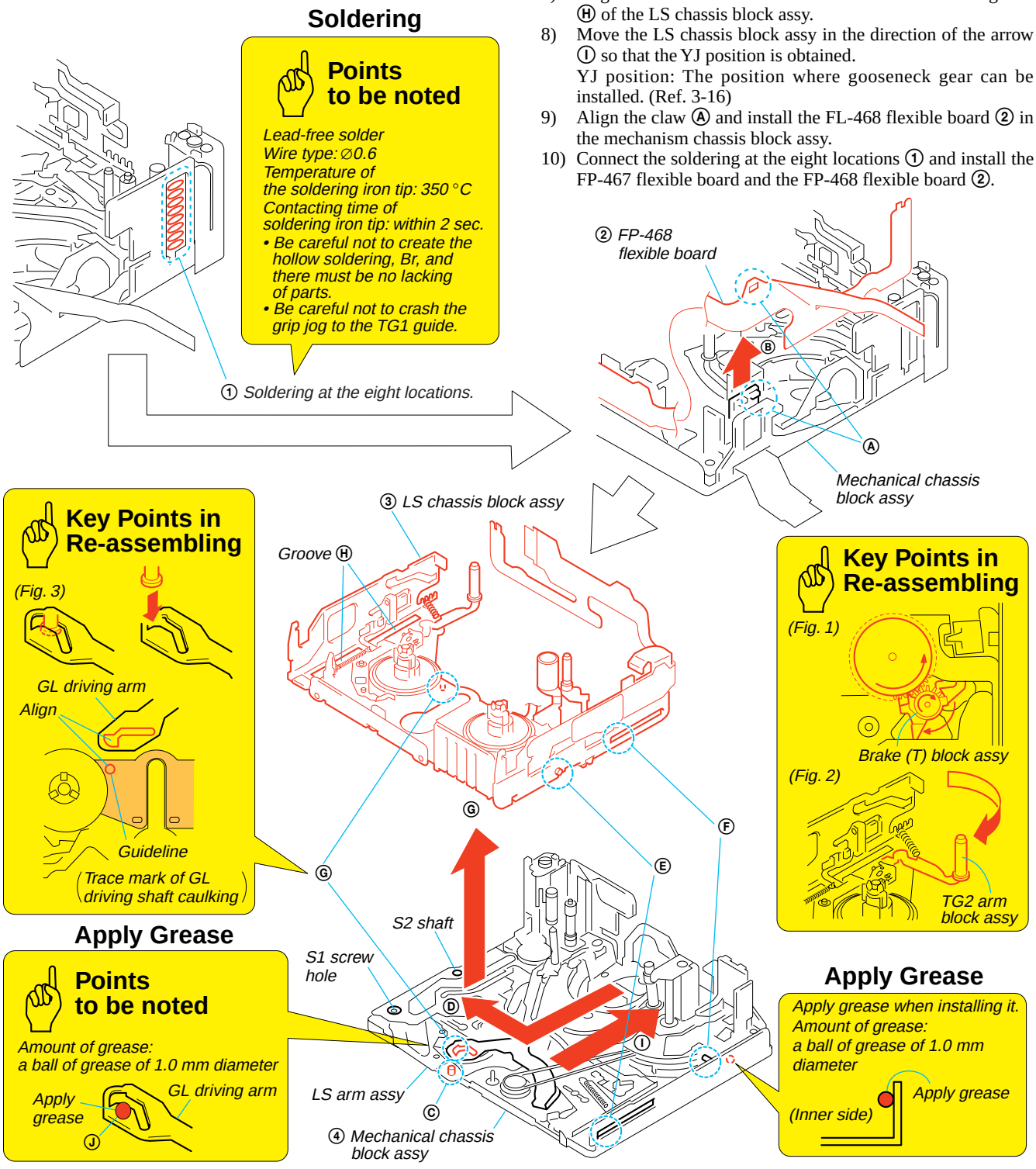
3-18. LS Chassis Block Assy and Mechanical Chassis Block Assy

1. Removal procedure

1) Remove soldering at the eight locations ①.
2) Release the claw Ⓐ and remove the FP-468 flexible board ② from the mechanical chassis block assy in the direction of the arrow Ⓑ.
3) Raise the front portion of the LS chassis block assy ③ so that the pin Ⓒ of the LS arm assy is removed. Move the LS chassis block assy ③ in the direction of the arrow Ⓓ and release the three pins of Ⓔ, Ⓕ and Ⓖ, and also groove.
4) Remove the LS chassis block ④ from the mechanical chassis block assy.

2. Attachment procedure

1) Apply grease to the GL drive arm Ⓙ portion and mechanism chassis block L.
   Amount of grease: a ball of grease of 1.0 mm diameter
2) Rotate the T reel table assy in the counter-clockwise direction and move the brake T block to the position shown in Fig. 1. (Fig. 1)
3) Move the TG2 arm block to the inner side. (Fig. 2)
4) Hold the cam groove of the GL driving arm with tweezers through LS chassis hole Ⓚ and pick it up.
5) Insert the GL drive shaft into the cam groove of the raised GL drive arm using the trace mark of caulking on the side of the S reel of the LS chassis block assy. (Fig. 3)
6) Align the pins Ⓔ, Ⓕ and Ⓖ with the grooves.
7) Align the left side S1 screw hole and S2 shaft with the goove Ⓗ of the LS chassis block assy.
8) Move the LS chassis block assy in the direction of the arrow Ⓘ so that the YJ position is obtained.
   YJ position: The position where gooseneck gear can be installed. (Ref. 3-16)
9) Align the claw Ⓐ and install the FL-468 flexible board ② in the mechanism chassis block assy.
10) Connect the soldering at the eight locations ① and install the FP-467 flexible board and the FP-468 flexible board ②.



3-19. Brake (T) Block Assy

1. Removal procedure

1) Hold the Ⓐ portion and remove the brake (T) block assy ①.

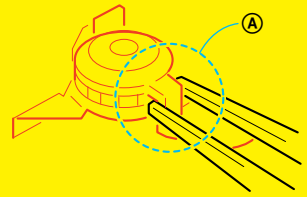
2. Attachment procedure

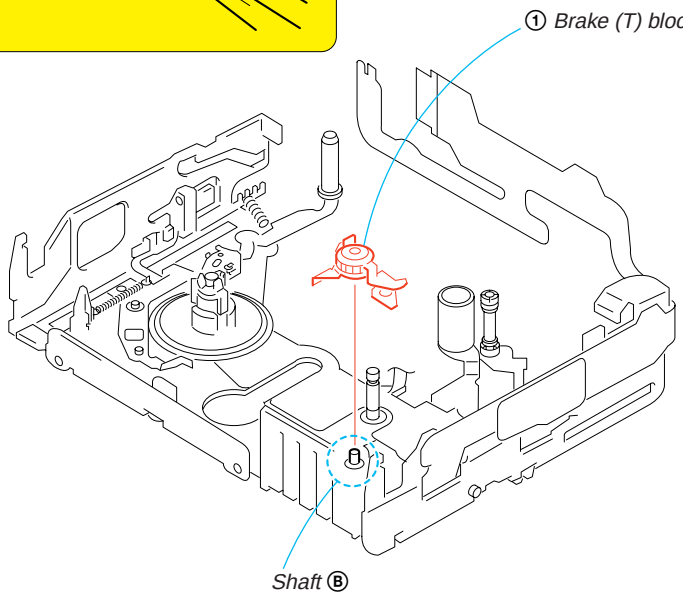
1) Hold the Ⓐ portion of the brake (T) block assy ①. While inserting the slot portion into the notch of the LS chassis block assy, install it into the shaft Ⓑ.
2) After completing installation of T reel table assy (Refer to 3-9.), rotate the brake (T) block assy ① in the clockwise direction by rotating T reel talbe assy in the counter-clockwise direction. (Fig. 1)

BRAKE (T) BLOCK ASSY

Points to be noted

Hold the Ⓐ portion

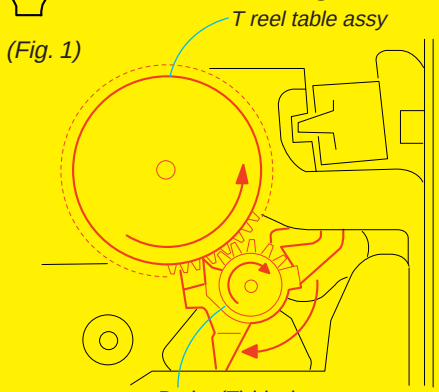




BRAKE (T) BLOCK ASSY

Key Points in Re-assembling

(Fig. 1)



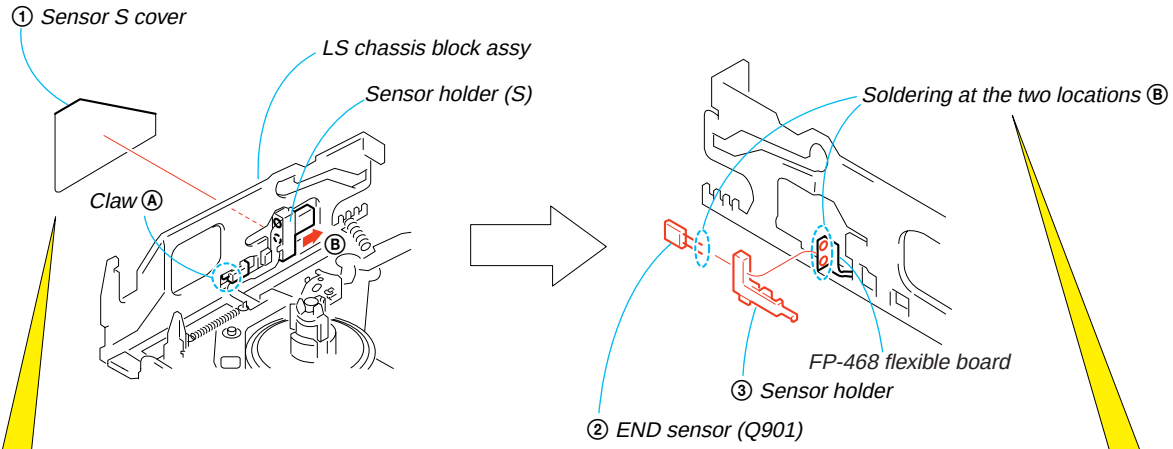
3-20. END Sensor (Q901)

1. Removal procedure

1) Peel off the sensor S cover ①.
2) Release the claw Ⓐ of the sensor holder (S) ③. Remove it from the LS chassis block assy by sliding it in the direction of the arrow Ⓑ.
3) Remove soldering at the two locations and remove the END sensor (Q901) ② and the sensor holder (S) ①.

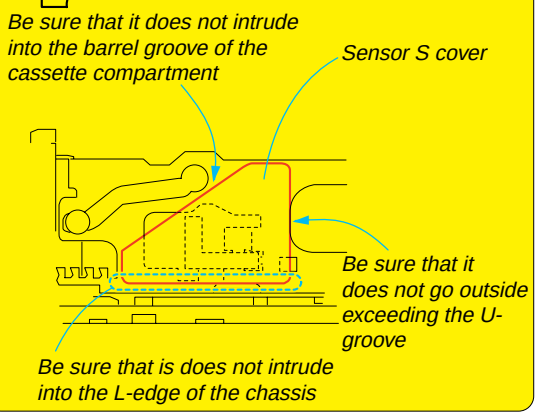
2. Attachment procedure

1) Connect the END sensor (Q901) ② and the sensor holder (S) ③ to the FP-468 flexible board by soldering them at the two locations Ⓑ.
2) Slide the END sensor (Q901) ② and the sensor holder (S) ③ in the direction of the arrow Ⓒ to install them in the LS chassis block assy.
3) Hook the flexible board on the end of the Ⓓ portion.
4) Attach the sensor S cover ①.



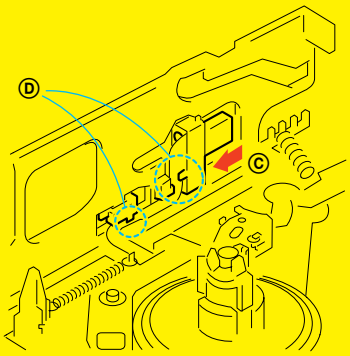
SENSOR S COVER

Key Points in Re-assembling


Be sure that it does not intrude into the barrel groove of the cassette compartment
Sensor S cover
Be sure that it does not go outside exceeding the U-groove
Be sure that is does not intrude into the L-edge of the chassis

END SENSOR (Q901), SENSOR HOLDER (S)

Key Points in Re-assembling



Soldering

Points to be noted

Use the rubber finger tip
cover Lead-free solder
Wire type : ∅0.6
Soldering iron : 941 made by Hakko
Soldering iron tip : T1-1BC

Temperature of the soldering iron tip : 300 ±10 °C
Contacting time of soldering iron tip : within 2 sec

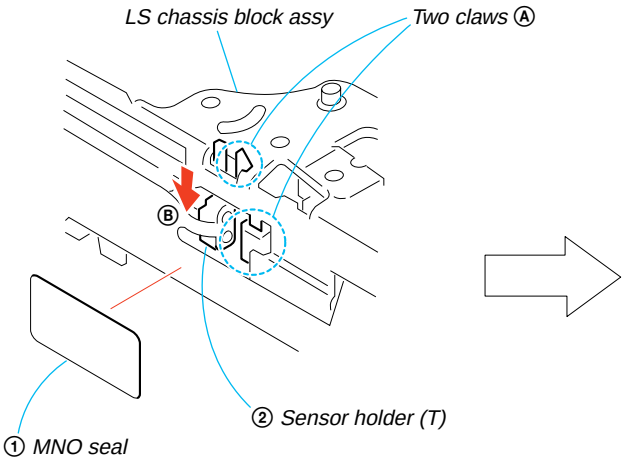
3-21. TOP Sensor (Q902)

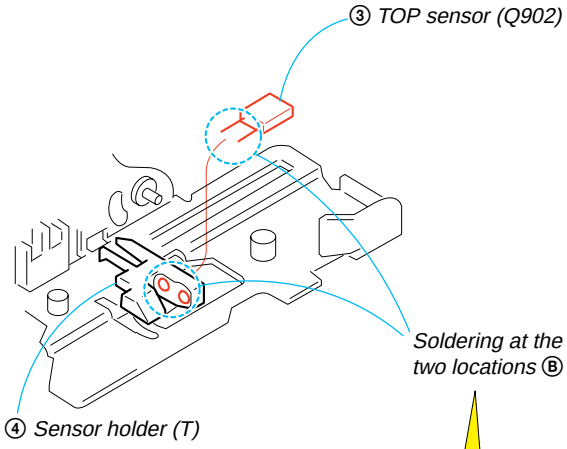
1. Removal procedure

1) Peel off the MNO seal ①.
2) Release the two claws of the sensor holder (T) ② at the two locations Ⓐ. Remove it from the LS chassis block assy by sliding it in the direction of the arrow Ⓑ.
3) Remove the soldering at the two locations Ⓑ and remove the TOP sensor (Q902) ③ and the sensor holder (T) ④.

2. Attachment procedure

1) Connect the TOP sensor (Q902) ③ and the sensor holder (T) ④ to the FP-468 flexible board by soldering them at the two locations Ⓑ.
2) Engage the two claws Ⓐ to install the TOP sensor (Q902) ③ and the sensor holder (T) ④ in the LS chassis block assy.
3) Attach the MNO seal ①.





Soldering

Points to be noted

Use the rubber finger tip cover
Lead-free solder
Wire type : ∅0.6
Soldering iron : 941 made by Hakko
Soldering iron tip : T1-1BC

Temperature of the soldering iron tip : 300 ±10 °C
Contacting time of soldering iron tip : within 2 sec

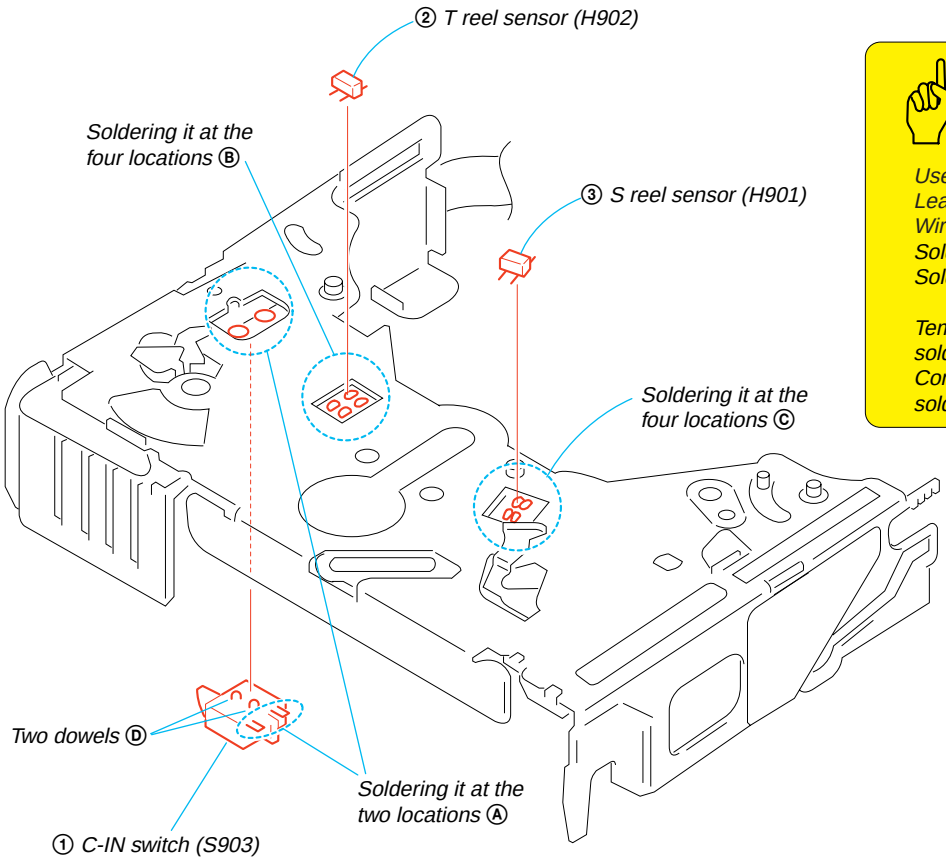
3-22. C-IN Switch (S903), S Reel Sensor (H901) and T Reel Sensor (H902)

1. Removal procedure

1) Remove soldering at the two locations Ⓐ and remove the C-IN switch (S903) ①.
2) Remove soldering at the four locations Ⓑ and remove the T reel sensor (H902) ②.
3) Remove soldering at the four locations Ⓑ and remove the S reel sensor (H901) ③.

2. Attachment procedure

1) Connect the S reel sensor (H901) ③ to the FP-468 flexible board by soldering it at the four locations Ⓒ.
2) Connect the T reel sensor (H902) ② to the FP-468 flexible board by soldering it at the four locations Ⓑ.
3) Align the two dowels Ⓓ and connect the C-IN switch (S903) ① to the FP-468 flexible board by soldering it at the two locations Ⓐ.


② T reel sensor (H902)
Soldering it at the four locations Ⓑ
③ S reel sensor (H901)
Soldering it at the four locations Ⓒ
Two dowels Ⓓ
Soldering it at the two locations Ⓐ
① C-IN switch (S903)

Soldering

Points to be noted

Use the rubber finger tip cover
Lead-free solder
Wire type : ∅0.6
Soldering iron : 941 made by Hakko
Soldering iron tip : T1-1BC

Temperature of the soldering iron tip : 300 ± 10 °C
Contacting time of soldering iron tip : within 2 sec

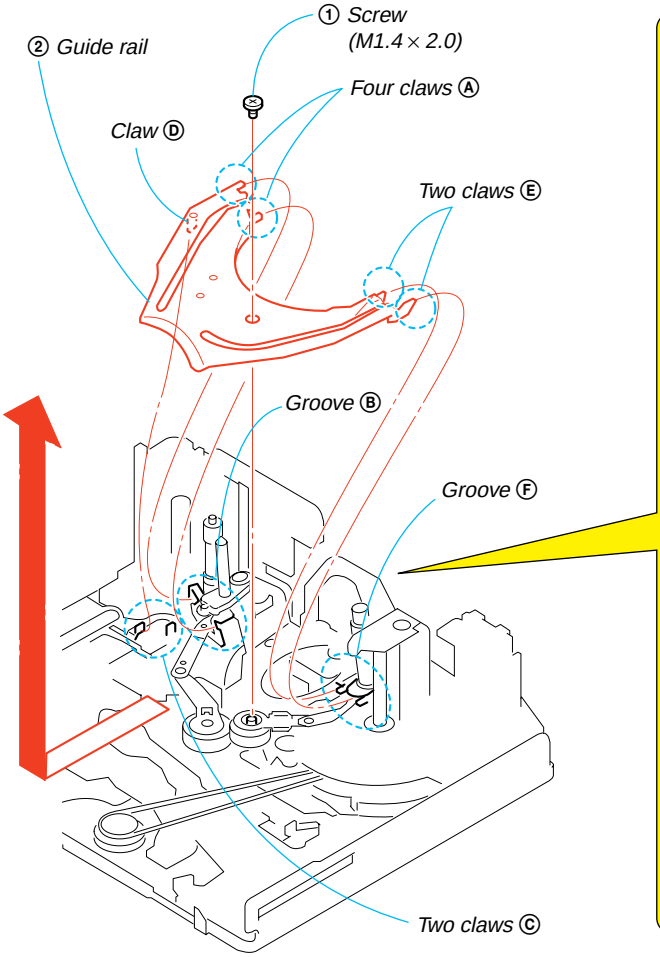
3-23. Guide Rail

1. Removal procedure

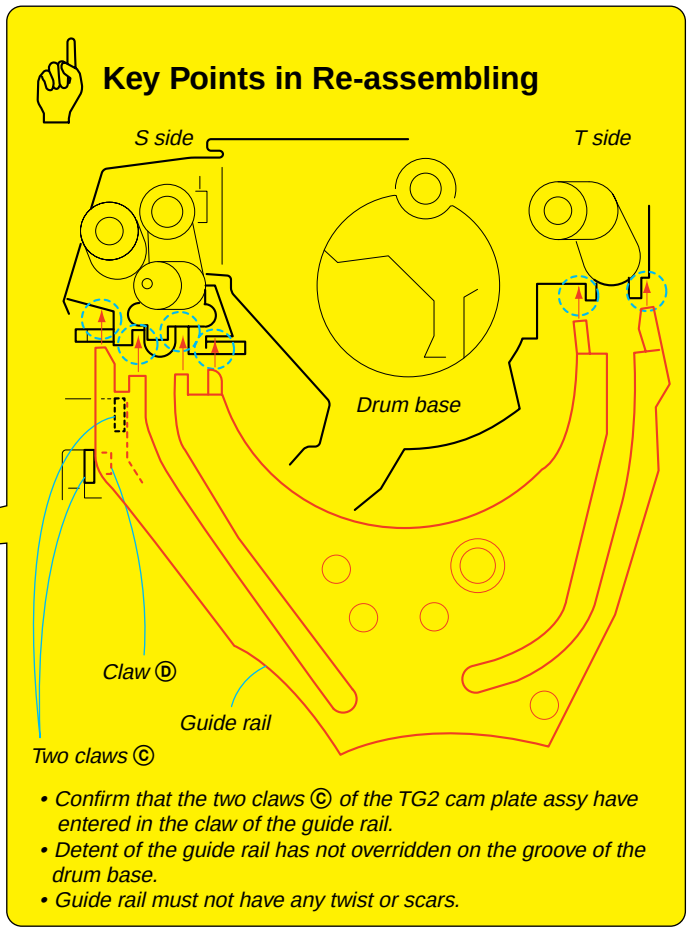
1) Remove the screw (special head screw M1.4 × 2.0) ①.
2) Remove the guide rail ② in the direction of the arrow.

2. Attachment procedure

1) Hold the center of the guide rail ②. While pressing the TG2 cam plate assy, insert the four claws Ⓐ of the guide rail in a slant angle from the top into the drum base's groove Ⓑ. (Insert the top tip of the rail at the same time.) Confirm at this time that the two claws of the TG cam plate assy have entered in the claw Ⓓ of the guide rail.
2) Insert the two claws Ⓔ of the T side guide rail into the groove Ⓕ of the drum base.
3) Tighten the screw (special head screw M1.4 × 2.0) ①.
Tightening torque: 0.059 ± 0.01N•m (0.6 ± 0.1kgf•cm)



GUIDE RAIL


Key Points in Re-assembling
S side
T side
Drum base
Claw Ⓓ
Guide rail
Two claws Ⓒ
• Confirm that the two claws Ⓒ of the TG2 cam plate assy have entered in the claw of the guide rail.
• Detent of the guide rail has not overridden on the groove of the drum base.
• Guide rail must not have any twist or scars.

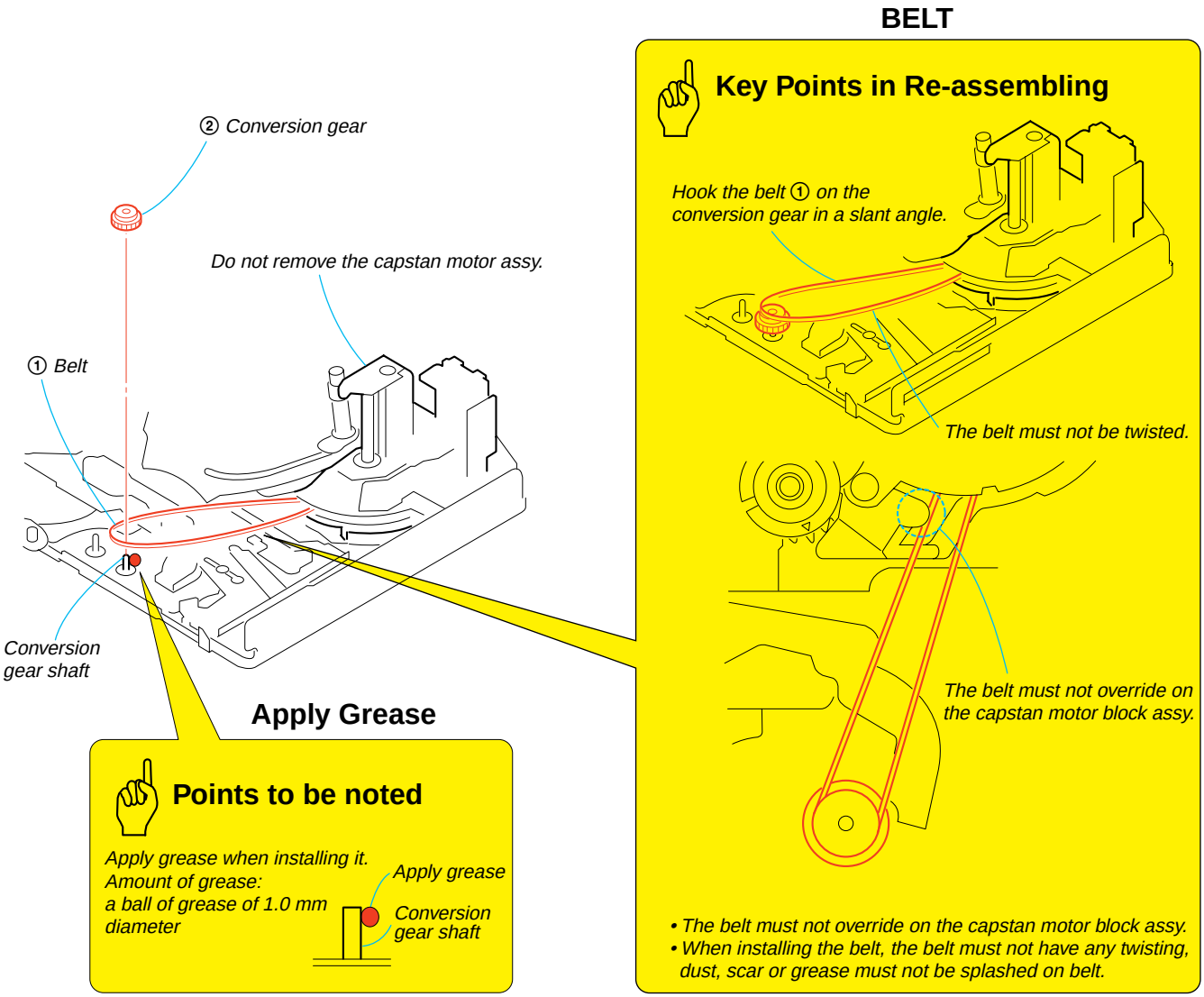
3-24. Conversion Gear

1. Removal procedure

1) Remove the belt ① from the conversion gear.
2) Remove the conversion gear ② from the conversion gear shaft.

2. Attachment procedure

1) Apply grease to the conversion gear shaft.
   Amount of grease: a ball of grease of 1.0 mm diameter
2) Install the conversion gear ② in the conversion gear shaft.
3) Hook the belt ① on the conversion gear in a slant angle and install it by rotating the conversion gear with fingertip.


② Conversion gear
Do not remove the capstan motor assy.
① Belt
Conversion gear shaft
Apply Grease
Points to be noted
Apply grease when installing it.
Amount of grease:
a ball of grease of 1.0 mm diameter
Apply grease
Conversion gear shaft
BELT
Key Points in Re-assembling
Hook the belt ① on the conversion gear in a slant angle.
The belt must not be twisted.
The belt must not override on the capstan motor block assy.
• The belt must not override on the capstan motor block assy.
• When installing the belt, the belt must not have any twisting, dust, scar or grease must not be splashed on belt.

3-25. Coaster (S) Block Assy and Coaster (T) Block Assy

1. Removal procedure

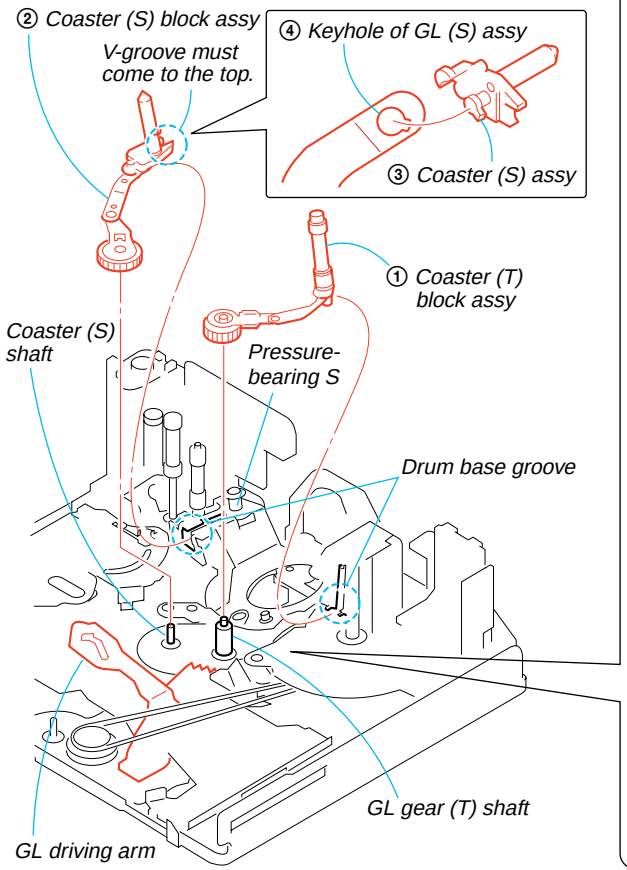
1) Remove the coaster (T) block assy ① from the coaster (T) block shaft. Remove the coaster (T) block assy from the right groove of the drum base.
2) Remove the coaster (S) block assy ② from the coaster (S) block shaft. Remove the coaster (S) block assy from the left groove of the drum base.
3) Remove coaster (S) assy ③ by rotating it through the key hole of GL (S) assy ④.

2. Attachment procedure

1) Install the coaster (S) assy ③ into the key hole of the GL (S) assy ④ by rotating it.
2) Insert the coaster (S) block assy ② into the coaster (S) block shaft. While aligning it with the left groove of the drum base, push it in the way that the V-groove comes to the top until it reaches the pressure-bearing S.
3) Push in the coaster (T) block assy ① along with the right groove of the drum base. Align the phase of the GL gear S, GL gear T and the GL drive arm at the three phasing locations. Then install the coaster (T) block assy ① in the coaster (T) block assy shaft.

Key Points in Re-assembling

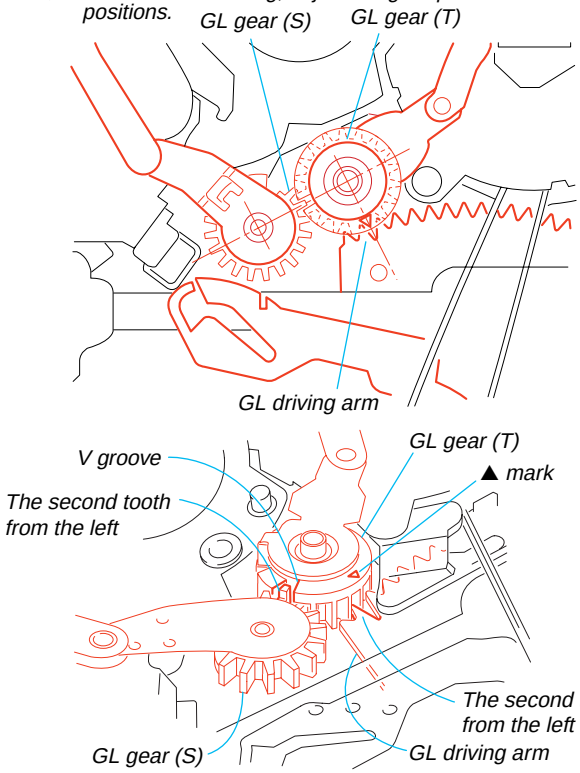
- *When aligning the coaster (S) assy with the left groove of the drum base, the V-groove must come to the top.*
- *TG4 and TG5 must not have any stain and their arms must not be deformed.*


② Coaster (S) block assy
V-groove must come to the top.
④ Keyhole of GL (S) assy
③ Coaster (S) assy
① Coaster (T) block assy
Coaster (S) shaft
Pressure-bearing S
Drum base groove
GL gear (T) shaft
GL driving arm

Phase Adjustment

Key Points in Re-assembling

When re-assembling, adjust the gear phase at the three positions.



- *The second tooth from the left of the GL gear (S) and the V-groove of the GL gear (T) must be in phase.*
- *The second tooth from the left of the GL drive arm and the ▲ mark must be in phase.*

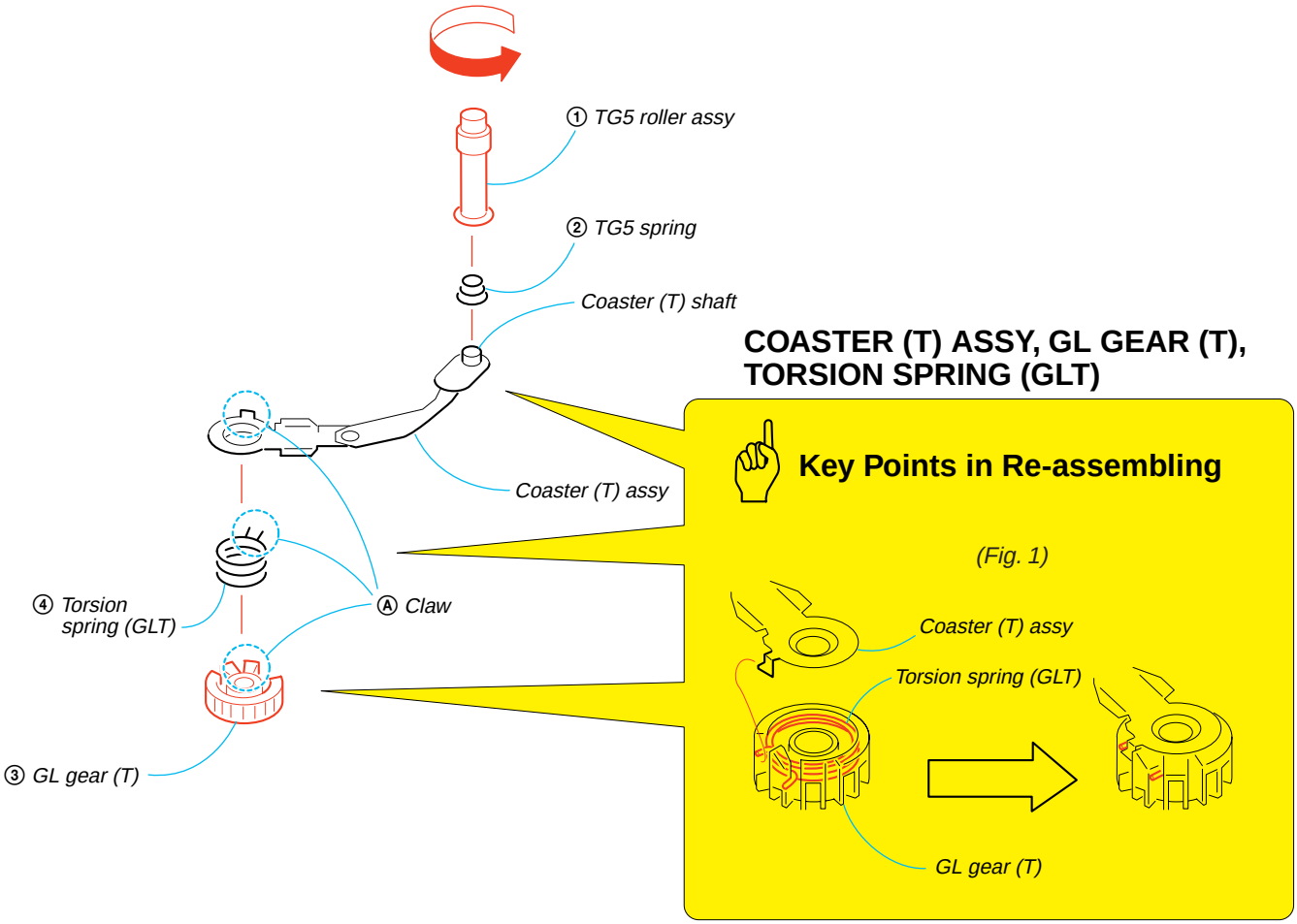
3-26. TG5 Roller Assy and GL Gear (T)

1. Removal procedure

1) Rotate the TG5 roller assy ① in the direction of the arrow and remove the TG5 roller assy ① and the TG5 spring ② from the coaster (T) assy.
2) Release the claw (A) and remove the GL gear (T) ③ and the torsion coil spring (GLT) ④ from the coaster (T) assy.

2. Attachment procedure

1) Install the GL gear (T) ③ and the torsion coil spring (GLT) ④ into the coaster (T) assy.
2) Install the TG5 spring ② into the coaster (T) assy.
3) Install the TG5 roller assy ① into the coaster (T) assy by rotating it in the direction opposite to the arrow.



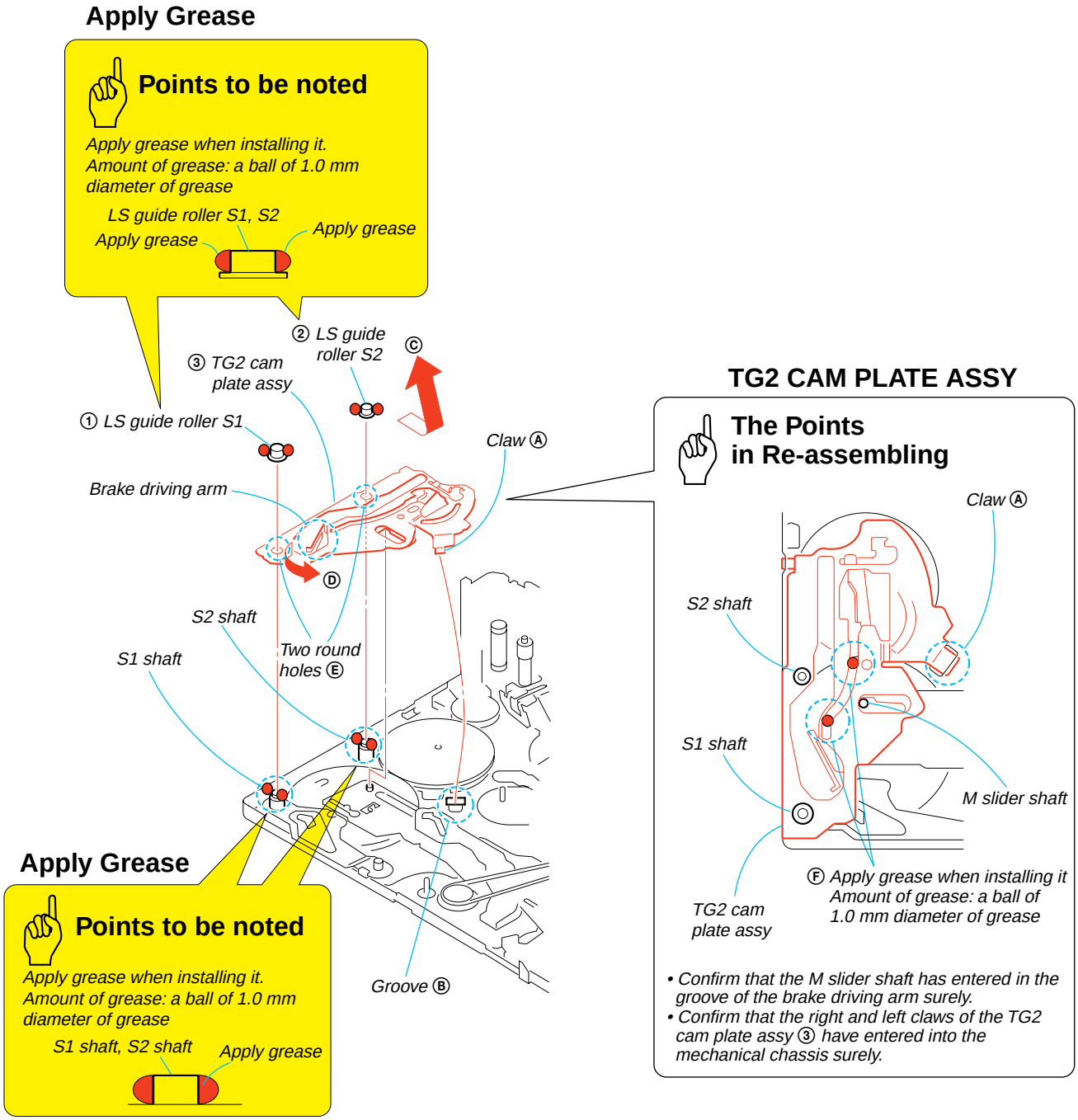
3-27. TG2 Cam Plate Assy

1. Removal procedure

1) Remove the LS guide roller (S1) ① from the S1 shaft.
2) Remove the LS guide roller (S2) ② from the S2 shaft.
3) Release the claw Ⓐ of the TG2 cam plate assy ③ from the right groove Ⓑ of the mechanical chassis.
4) Remove the TG2 cam plate assy ③ in the direction of the arrow Ⓒ.

2. Attachment procedure

1) Move the brake driving arm of the TG2 cam plate assy ③ in the direction of the arrow Ⓓ.
2) Insert the right claw Ⓐ of the TG2 cam plate assy ③ into the right groove Ⓑ of the mechanical chassis first.
3) Install the two round holes Ⓔ of the TG2 cam plate assy ③ into the S1 shaft and the S2 shaft.
4) Apply grease in the Ⓕ portion of the TG2 cam plate assy.
   Amount of grease: a ball of 1.0 mm diameter of grease
5) Apply grease to both sides of the S1 shaft and the S2 shaft.
   Amount of grease: a ball of 1.0 mm diameter of grease
6) Apply grease to both sides of the LS guide roller S1, S2.
7) Install the LS guide roller S1 ① in the S1 shaft.
8) Install the LS guide roller S2 ② in the S2 shaft.


Apply Grease
Points to be noted
Apply grease when installing it.
Amount of grease: a ball of 1.0 mm diameter of grease
LS guide roller S1, S2
Apply grease
Apply grease
② LS guide roller S2
Ⓒ
③ TG2 cam plate assy
① LS guide roller S1
Claw Ⓐ
Brake driving arm
Ⓓ
S2 shaft
S1 shaft
Two round holes Ⓔ
Groove Ⓑ
Apply Grease
Points to be noted
Apply grease when installing it.
Amount of grease: a ball of 1.0 mm diameter of grease
S1 shaft, S2 shaft
Apply grease
TG2 CAM PLATE ASSY
The Points in Re-assembling
Claw Ⓐ
S2 shaft
S1 shaft
M slider shaft
Ⓕ Apply grease when installing it
Amount of grease: a ball of 1.0 mm diameter of grease
TG2 cam plate assy
• Confirm that the M slider shaft has entered in the groove of the brake driving arm surely.
• Confirm that the right and left claws of the TG2 cam plate assy ③ have entered into the mechanical chassis surely.

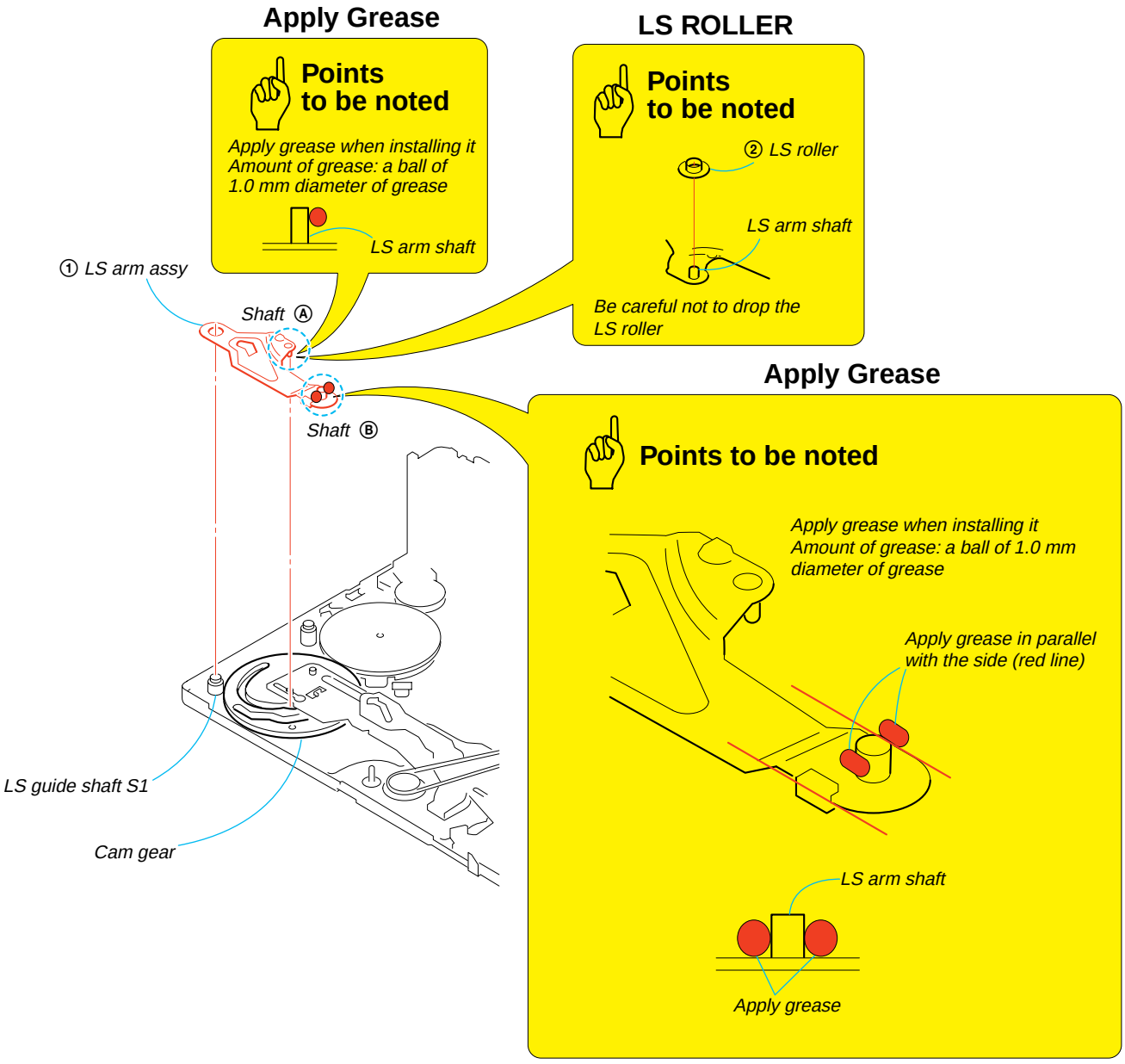
3-28. LS Arm Assy

1. Removal procedure

1) Remove the LS arm assy ① from the LS guide S1 shaft.
2) Turn over the LS arm assy and remove the LS roller ②.

2. Attachment procedure

1) Apply grease to the LS arm shaft Ⓐ (on the side).
2) Install the LS roller ② into the LS arm shaft.
3) Turn over the LS arm assy ① and install it while matching the phase of the LS guide shaft S1 and the cam gear groove.
4) Apply grease to the LS arm shaft Ⓑ (on its side).


Apply Grease
Points to be noted
Apply grease when installing it
Amount of grease: a ball of 1.0 mm diameter of grease
LS arm shaft
LS ROLLER
Points to be noted
② LS roller
LS arm shaft
Be careful not to drop the LS roller
① LS arm assy
Shaft Ⓐ
Shaft Ⓑ
Apply Grease
Points to be noted
Apply grease when installing it
Amount of grease: a ball of 1.0 mm diameter of grease
Apply grease in parallel with the side (red line)
LS arm shaft
Apply grease
LS guide shaft S1
Cam gear

3-29. M Slider Assy (1)

1. Removal procedure

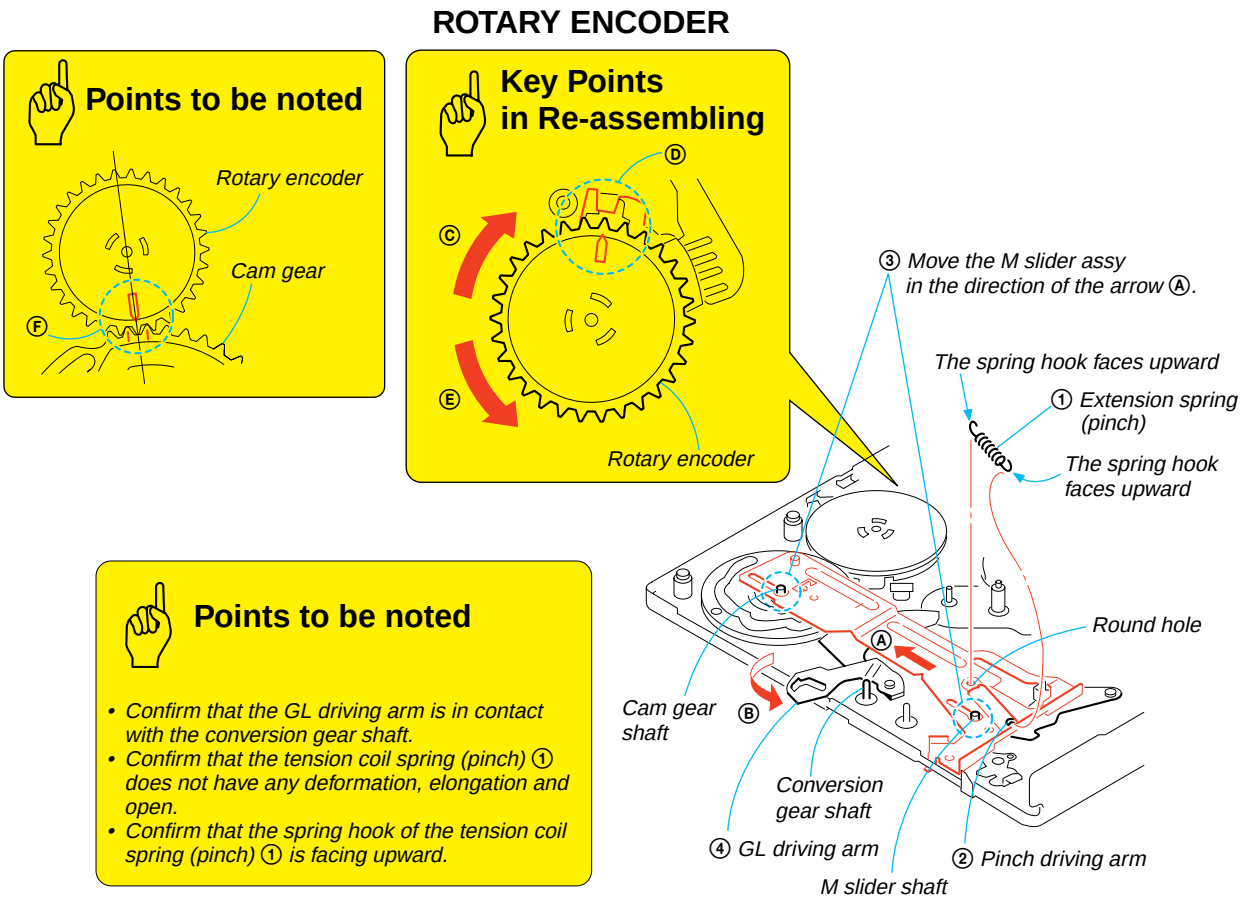
1) Remove an end of the tension spring (pinch) ① from the round hole of the M slider.
2) Remove another end of the tension spring (pinch) ① from the pinch driving arm ②.
3) Rotate the rotary encoder in the direction of the arrow Ⓔ, and align the ▲ mark of ratary encoder with the tooth bottom between second and third teeth Ⓕ. Move by hand in the direction of the arrow Ⓐ until the cam gear shaft and M slider shaft match with the shaft hole of the M slider assy ③.
4) Push in the direction of the arrow Ⓑ until the GL driving arm ④ gets in contact with the conversion gear shaft.

(to be continued to next items 5) through 7) on next page)

2. Attachment procedure

(continued from the previous items 1) through 5) on next page)

6) Move the conversion gear shaft in the direction opposite tot he arrow mark Ⓑ as far as it can go.
7) Rotate the rotary encoder in the direction of the arrow Ⓒ until the ▲ mark arrives at the position Ⓓ.
8) Install an end of the tension coil spring (pinch) ① on the pinch driving arm ② (in the way that spring hook faces upward).
9) Install another end of the tension coil spring (pinch) ① on the round hole of the M slider (in the way that spring hook faces upward).


ROTARY ENCODER
Points to be noted
Rotary encoder
Cam gear
Ⓕ
Key Points in Re-assembling
Ⓓ
Ⓒ
Ⓔ
Rotary encoder
③ Move the M slider assy in the direction of the arrow Ⓐ.
The spring hook faces upward
① Extension spring (pinch)
The spring hook faces upward
Round hole
Cam gear shaft
Ⓑ
Conversion gear shaft
④ GL driving arm
② Pinch driving arm
M slider shaft
Points to be noted
• Confirm that the GL driving arm is in contact with the conversion gear shaft.
• Confirm that the tension coil spring (pinch) ① does not have any deformation, elongation and open.
• Confirm that the spring hook of the tension coil spring (pinch) ① is facing upward.

3-30. M Slider Assy (2)

1. Removal procedure

(continued from the previous items 1) through 5) on previous page)

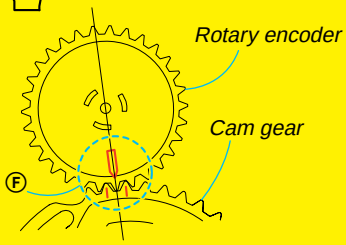
5) Remove the cam gear shaft and the M slider shaft from the two shaft holes Ⓐ of the M slider assy ①.
6) Remove the top tip Ⓑ of the M slider assy ① from the notch of the mechanical chassis in the direction of the arrow.
7) Remove the M slider assy ①.

2. Attachment procedure

1) Apply grease to the cam gear shaft and the M slider shaft (neck groove of the shaft where the M slider slides).
   Amount of grease: a ball of 1.0 mm diameter of grease
2) Align the hole of the pinch driving arm and the hole of the mechanical chassis.
3) Insert the top tip Ⓑ of the M slider assy ① into the notch of the mechanism chassis, and at the same time install the M slider assy ① into the GL driving arm.
4) Align the ▲ mark of rotary encoder with the tooth bottom between second and third teeth Ⓕ.
5) Install the cam gear shaft and the M slider shaft into the tow shaft holes Ⓐ of the M slider assy.

(to be continued to next items 6) through 9) on previous page)

Points to be noted



M SLIDER ASSY

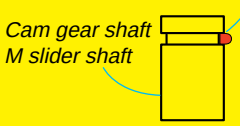
Key Points in Re-assembling

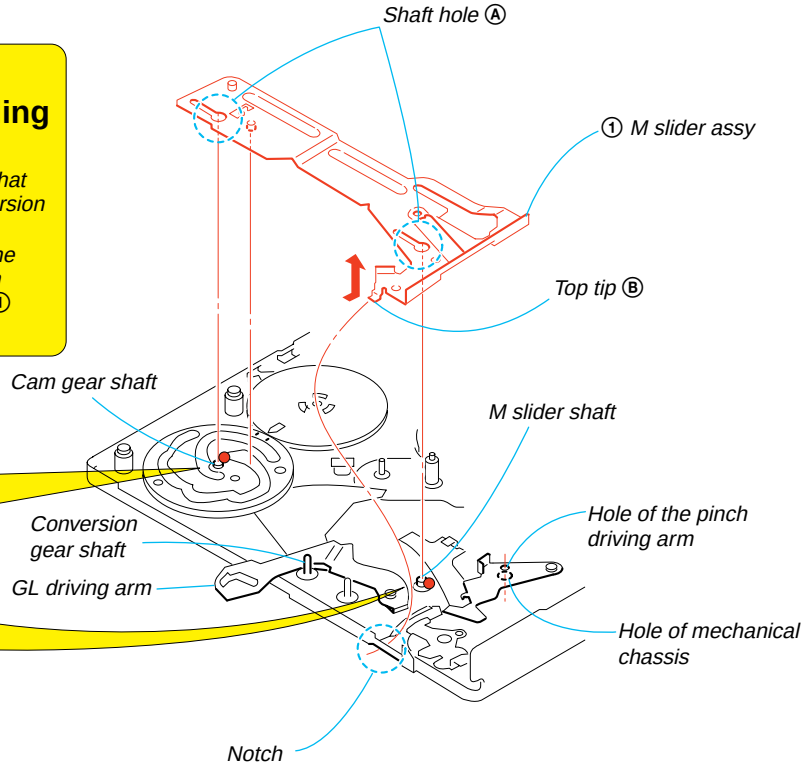
- *When installing the M slider assy ①, confirm that the GL driving arm is in contact with the conversion gear shaft.*
- *Confirm that you have not forgotten to insert the top tip Ⓑ of the M slider assy ① into the notch of the mechanical chassis. The M slider assy ① should not have any deformation.*

Apply Grease

Points to be noted

Apply grease when installing it
Amount of grease: a ball of 1.0 mm diameter of grease
Neck groove of the shaft where the M slider slides





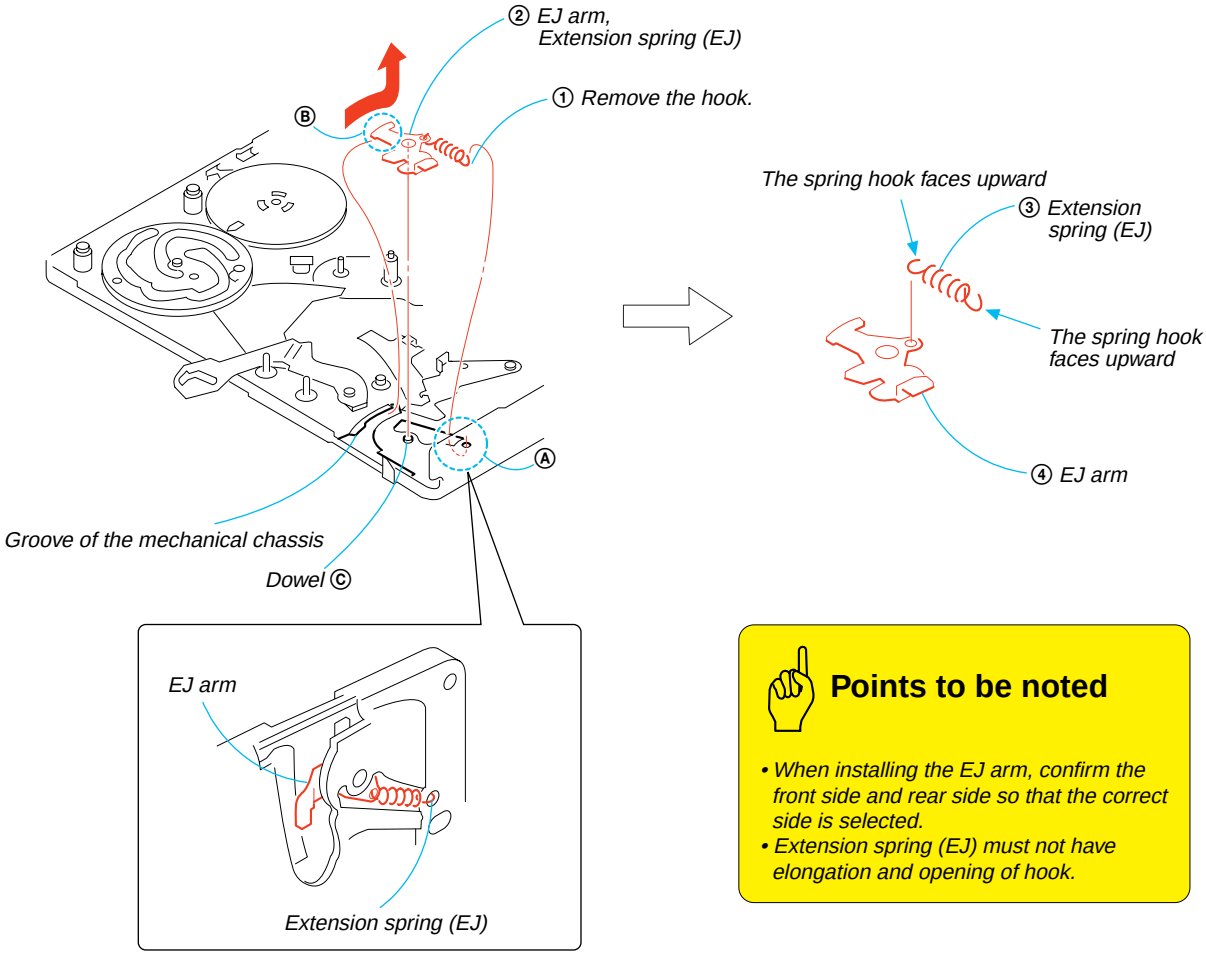
3-31. EJ Arm

1. Removal procedure

1) Remove the hook ① of the tension coil spring (EJ arm) ③ that is hooked on the round hole Ⓐ.
2) Remove the EJ arm and the tension coil spring (EJ arm) ② all together in the direction of the arrow.
3) Remove the tension coil spring (EJ arm) ③ from the EJ arm ④.

2. Attachment procedure

1) Install the tension coil spring (EJ arm) ③ into the round hole of the EJ arm ④ with the hook facing upward.
2) Insert the top tip (bent) portion Ⓑ of the EJ arm ④ into the groove of the mechanical chassis. Insert the dowel Ⓒ into the round hole of the EJ arm.
3) Insert he tension coil spring ① into the round hole Ⓐ of the mechanical chassis with the hook facing upward.



Points to be noted

- *When installing the EJ arm, confirm the front side and rear side so that the correct side is selected.*
- *Extension spring (EJ) must not have elongation and opening of hook.*

3-32. Cam Gear and GL Driving

1. Removal procedure

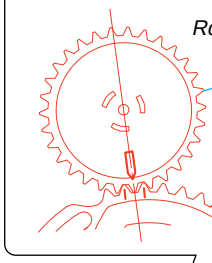
1) Rotate the GL driving arm Ⓗ block assy in the direction of the arrow Ⓘ until it contacts with the conversion gear shaft.
2) Remove the cam gear ②.
3) Remove the GL driving arm ③.

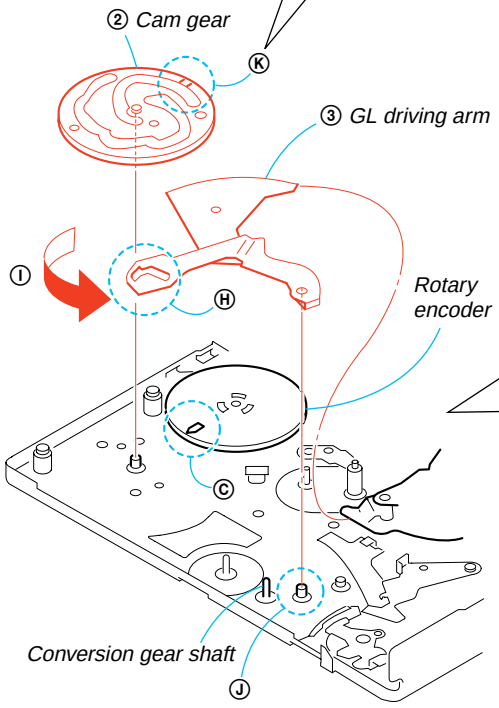
2. Attachment procedure

1) Insert the GL driving arm ③ into the shaft Ⓙ of the mechanical chassis and rotate the GL driving arm Ⓗ block assy in the direction of the arrow Ⓘ until it contacts with the conversion gear shaft.
2) Confirm the front side and rear side of the cam gear ② so that the correct side is selected. Install the cam gear ② while matching phase of the ▲ mark Ⓒ with the second tooth valley Ⓚ and the third tooth valley Ⓚ of the cam gear.
3) Apply grease to the specified locations Ⓐ to Ⓖ of the cam gear.

Matching Phase

Key Points in Re-assembling



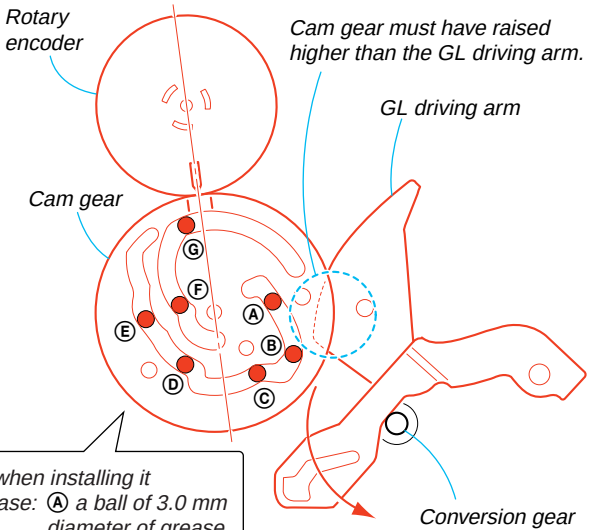


Points to be noted

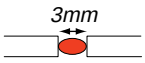
- *Confirm that the phase of the cam gear and that of the rotary encoder are matched and in phase.*
- *Confirm that the cam gear overrides on the GL driving arm.*
- *Confirm that the GL driving arm is contact with the conversion shaft.*
- *Do not apply grease to any locations other than the specified location. Apply grease of the specified amount.*

Notes When Applying Grease and During Installation

Key Points in Re-assembling



Apply grease when installing it
Amount of grease: Ⓐ a ball of 3.0 mm diameter of grease Ⓑ to Ⓖ a ball of 2.0 mm diameter of grease



Sides of the both grooves

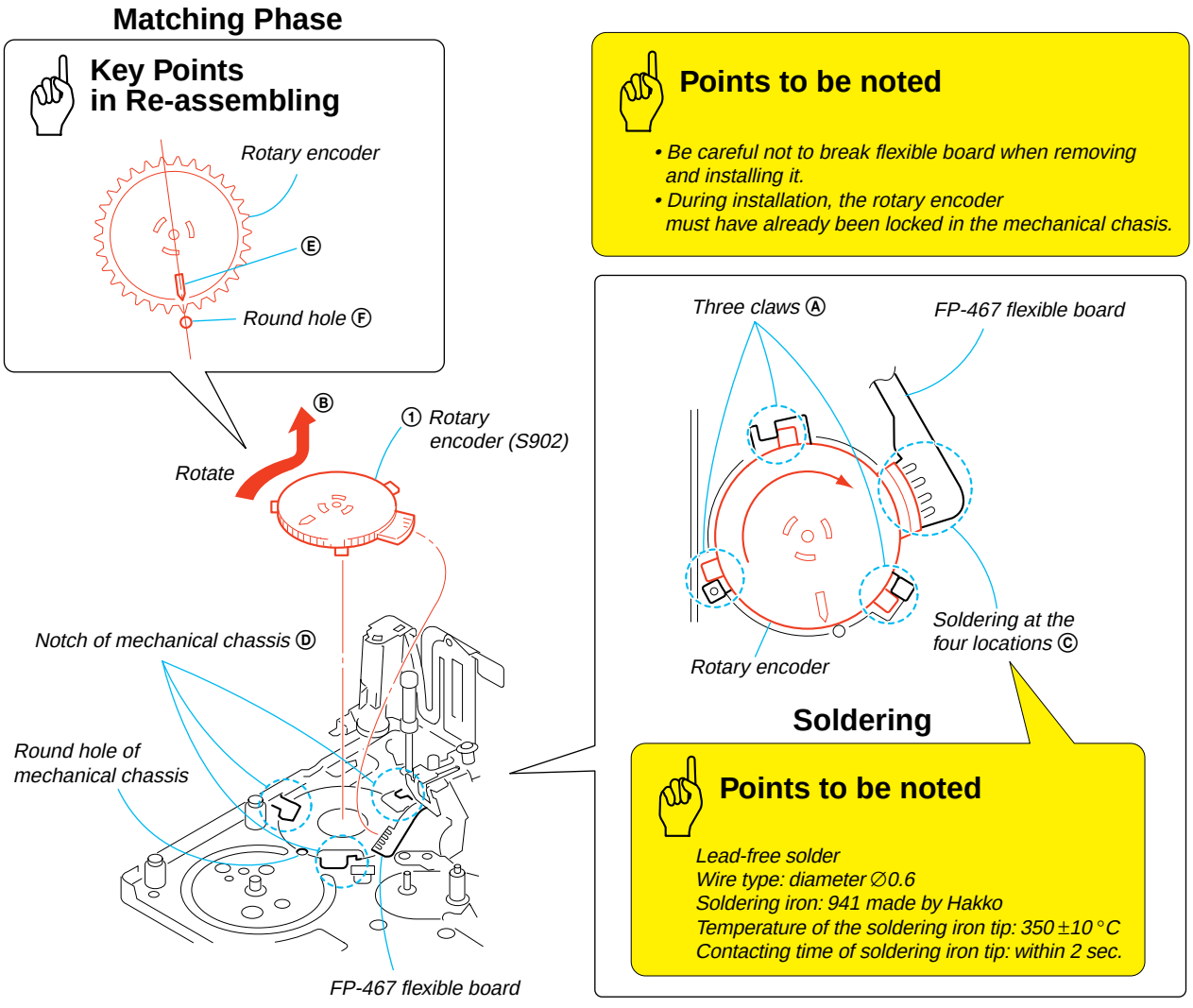
3-33. Rotary Encoder (S902)

1. Removal procedure

1) Remove the three claws Ⓐ of the rotary encoder (S902) ① from the three notches of the mechanical chassis.
2) Rotate the rotary encoder (S902) ① in the direction of the arrow Ⓑ and remove.
3) Remove soldering (at the four locations) Ⓒ to which the rotary encoder (S902) is attached.

2. Attachment procedure

1) Make soldering (at the four locations) Ⓒ so that the rotary encoder (S902) ① is connected to the FP-467 flexible board.
2) Place the rotary encoder (S902) ① on top of the notch Ⓓ of the mechanical chassis. Lock the three claws Ⓐ of the rotary encoder (S902) ① into the notches Ⓓ of the mechanical chassis.
3) Match the phase of the ▲ mark Ⓔ of the rotary encoder (S902) ① with the phase of the round hole Ⓕ of the mechanical chassis.


Matching Phase
Key Points in Re-assembling
Rotary encoder
Ⓔ
Round hole Ⓕ
Ⓑ
① Rotary encoder (S902)
Rotate
Notch of mechanical chassis Ⓓ
Round hole of mechanical chassis
FP-467 flexible board
Points to be noted
• Be careful not to break flexible board when removing and installing it.
• During installation, the rotary encoder must have already been locked in the mechanical chasis.
Three claws Ⓐ
FP-467 flexible board
Soldering at the four locations Ⓒ
Rotary encoder
Soldering
Points to be noted
Lead-free solder
Wire type: diameter ∅0.6
Soldering iron: 941 made by Hakko
Temperature of the soldering iron tip: 350 ±10 °C
Contacting time of soldering iron tip: within 2 sec.

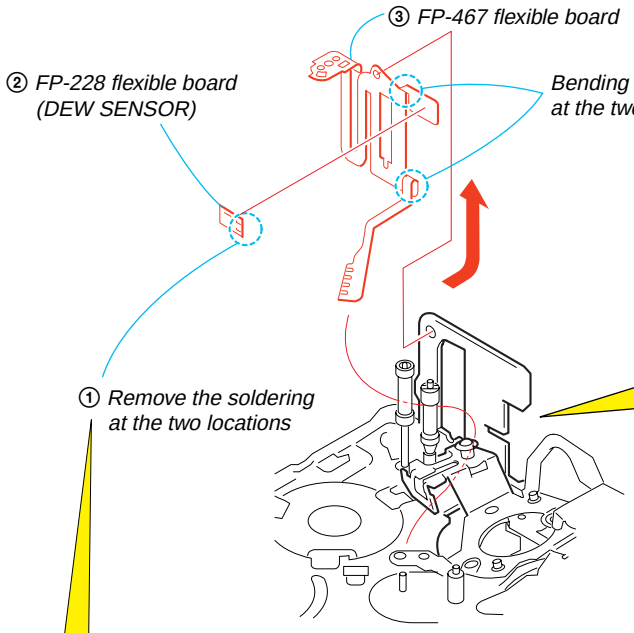
3-34. FP-228 Flexible Board (DEW SENSOR) and FP-467 Flexible Board

1. Removal procedure

1) Remove the soldering at the two locations ① and remove the FP-228 flexible board (DEW SENSOR) ②.
2) Remove the FP-467 flexible board ③ from the mechanical chassis in the direction of the arrow.

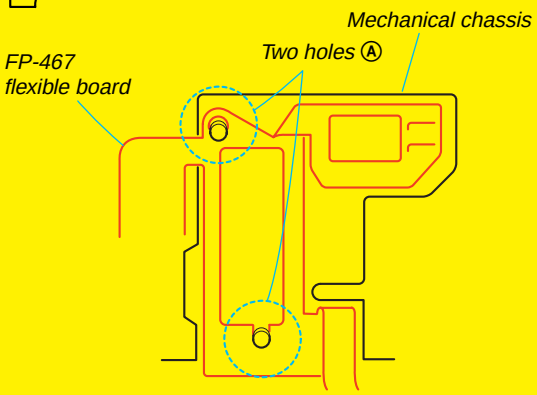
2. Attachment procedure

1) Match the phase of the two holes Ⓐ of the FP-467 flexible board ③ with the holes of the mechanical chassis, and attach them each other.
2) Attach the FP-228 flexible board (DEW SENSOR) ② to the FP-467 flexible board ③.
3) Connect the terminals at the two locations ① by soldering.


③ FP-467 flexible board
② FP-228 flexible board (DEW SENSOR)
Bending the flexible board at the two locations
① Remove the soldering at the two locations

FP-467 FLEXIBLE BOARD

Key Points in Re-assembling



Soldering

Points to be noted

Lead-free solder
Temperature of the soldering iron tip: 350 °C
Contacting time of soldering iron tip: within 2 sec.

- *Be careful not to create the hollow soldering, Br, and there must be no lacking of parts. There must not be solder ball.*
- *Be careful not to contact the soldering iron tip too long time.*

Points to be noted

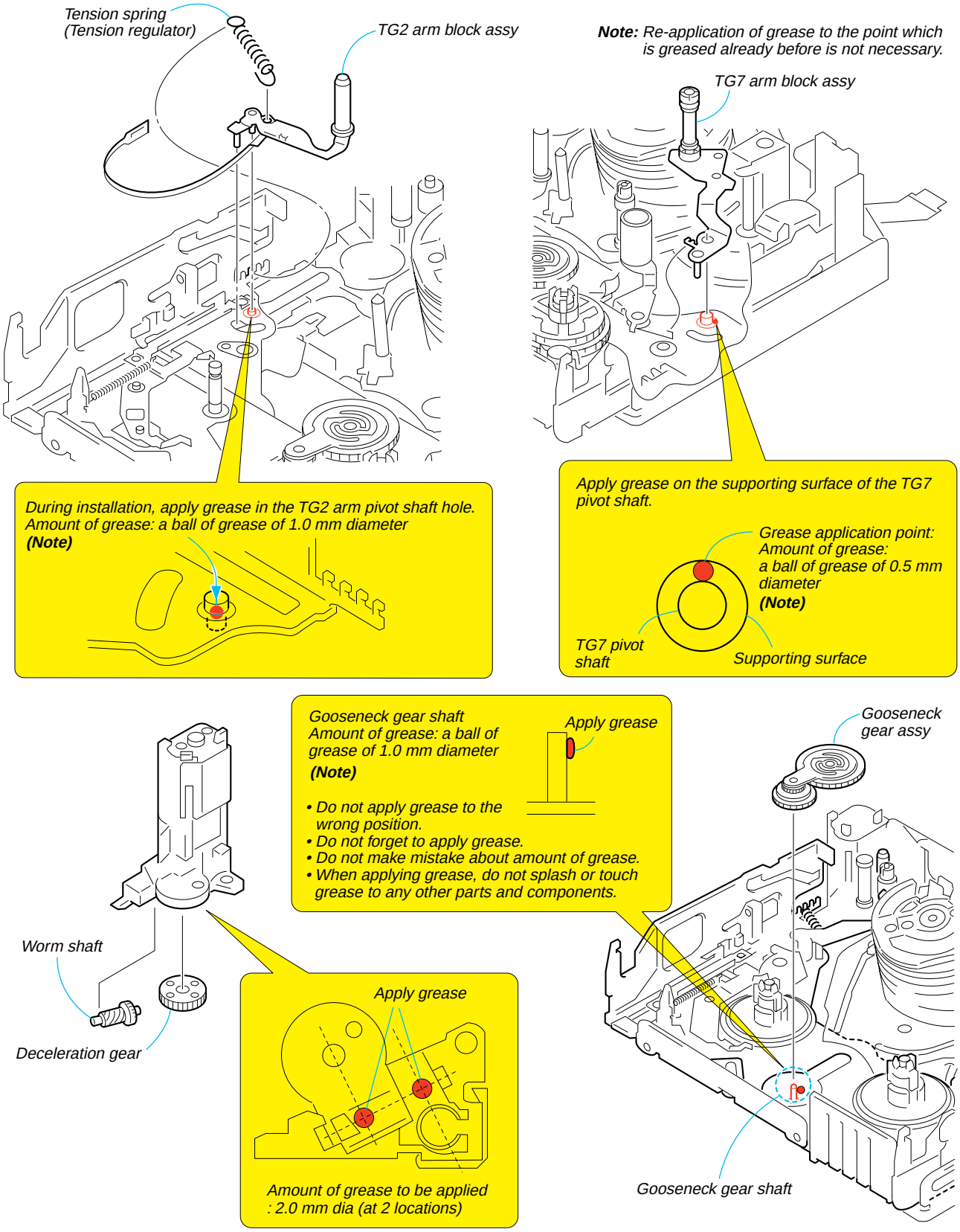
- *Be careful not to break the flexible board to have open circuit when installing and removing it.*
- *Be careful that flexible board must not override on anything.*
- *Be careful that the two bending portions of the FP-467 flexible board must not be bent excessively that results in open circuit and breakdown of flexible board.*
- *Do not rub the DEW sensor with any rubbing bars.*

2003.01.30

HELP

Application of grease, soldering method and precautions, and phase matching adjustment are compiled and below.

Apply grease (1)

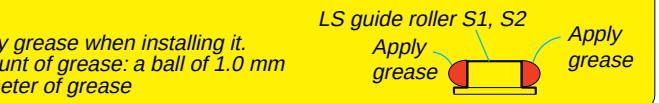

Tension spring
(Tension regulator)
TG2 arm block assy
Note: Re-application of grease to the point which is greased already before is not necessary.
TG7 arm block assy
During installation, apply grease in the TG2 arm pivot shaft hole.
Amount of grease: a ball of grease of 1.0 mm diameter
(Note)
Apply grease on the supporting surface of the TG7 pivot shaft.
Grease application point:
Amount of grease:
a ball of grease of 0.5 mm diameter
(Note)
TG7 pivot shaft
Supporting surface
Gooseneck gear shaft
Amount of grease: a ball of grease of 1.0 mm diameter
(Note)
Apply grease
• Do not apply grease to the wrong position.
• Do not forget to apply grease.
• Do not make mistake about amount of grease.
• When applying grease, do not splash or touch grease to any other parts and components.
Gooseneck gear assy
Worm shaft
Deceleration gear
Apply grease
Amount of grease to be applied
: 2.0 mm dia (at 2 locations)
Gooseneck gear shaft

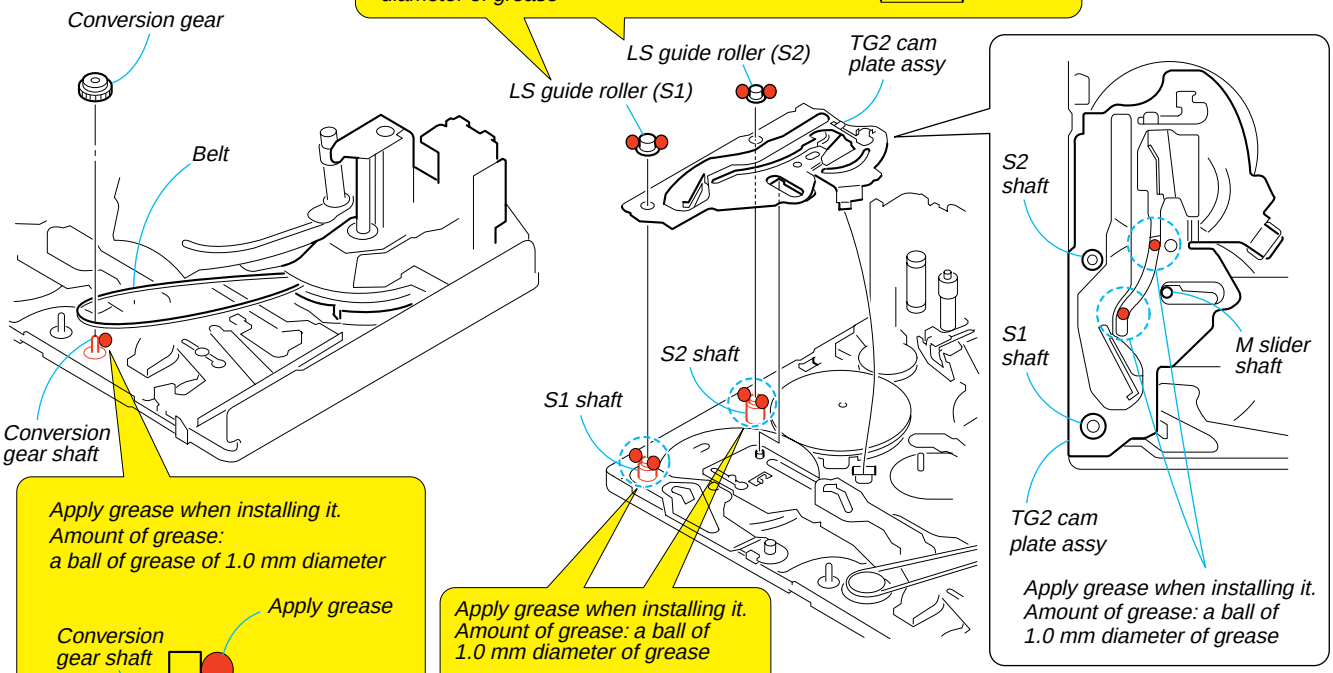
Apply grease (2)

Apply Grease

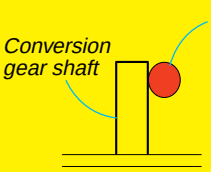
Points to be noted

Apply grease when installing it.
Amount of grease: a ball of 1.0 mm diameter of grease



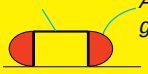


Apply grease when installing it.
Amount of grease:
a ball of grease of 1.0 mm diameter



Apply grease when installing it.
Amount of grease: a ball of 1.0 mm diameter of grease

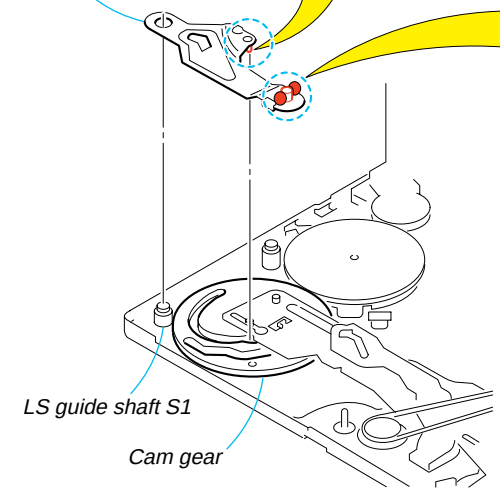
S1 shaft, S2 shaft



Apply grease when installing it.
Amount of grease: a ball of 1.0 mm diameter of grease

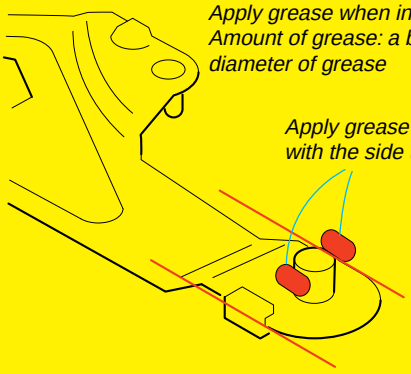
Apply grease when installing it.
Amount of grease: a ball of 1.0 mm diameter of grease

LS arm shaft

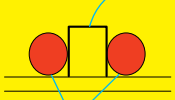


Apply grease when installing it.
Amount of grease: a ball of 1.0 mm diameter of grease

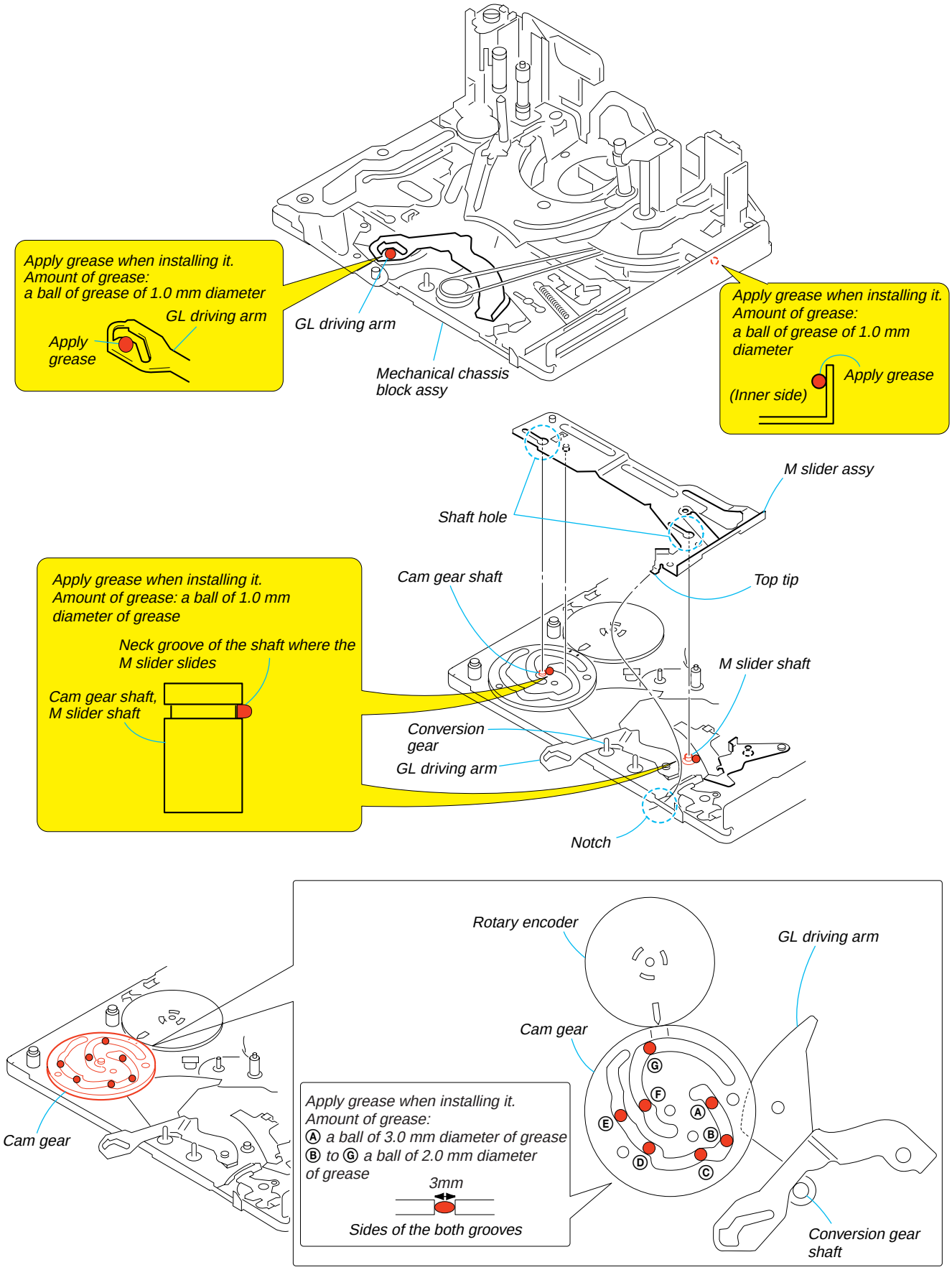
Apply grease in parallel with the side (red line)



LS arm shaft



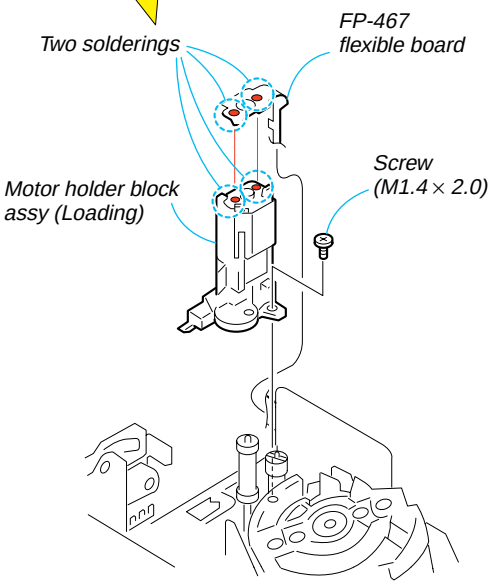
Apply grease (3)

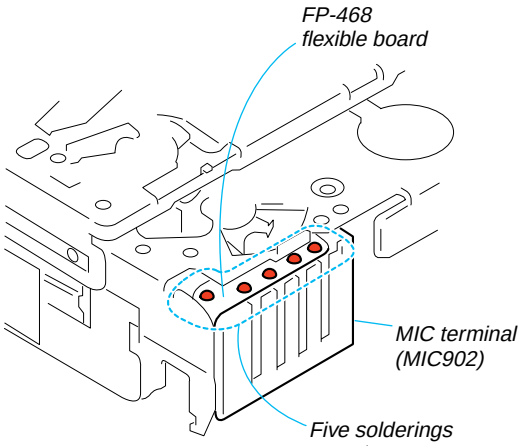

Apply grease when installing it.
Amount of grease:
a ball of grease of 1.0 mm diameter
GL driving arm
Apply grease
GL driving arm
Mechanical chassis block assy
Apply grease when installing it.
Amount of grease:
a ball of grease of 1.0 mm diameter
Apply grease
(Inner side)
M slider assy
Shaft hole
Top tip
Cam gear shaft
M slider shaft
Apply grease when installing it.
Amount of grease: a ball of 1.0 mm diameter of grease
Neck groove of the shaft where the M slider slides
Cam gear shaft, M slider shaft
Conversion gear
GL driving arm
Notch
Rotary encoder
GL driving arm
Cam gear
Cam gear
Apply grease when installing it.
Amount of grease:
Ⓐ a ball of 3.0 mm diameter of grease
Ⓑ to Ⓖ a ball of 2.0 mm diameter of grease
3mm
Sides of the both grooves
Conversion gear shaft

Soldering (1)

Lead-free solder
Wire type : ∅0.6
Temperature of the soldering iron tip : 320 °C
Contacting time of soldering iron tip : within 2 sec.

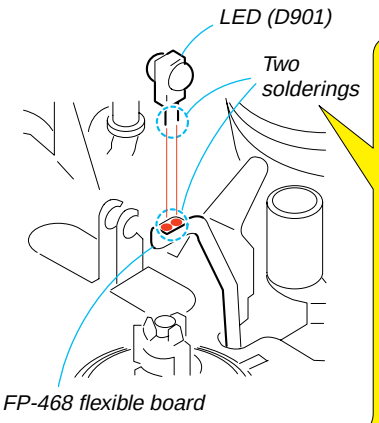
- Be careful not to create the hollow soldering, Br, and there must be no lacking of parts.
- Be careful not to melt the detent of the holder.
- Be careful not to melt the END cover.
- Be careful not to break the terminals due to attaching the soldering iron too long time.



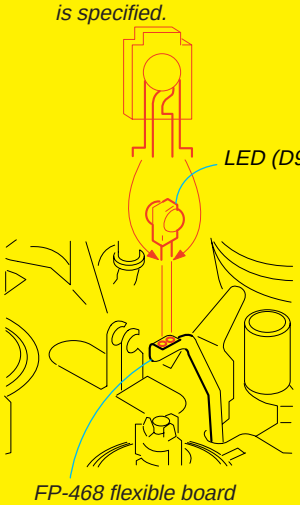


Use the rubber finger tip cover
Lead-free solder
Wire type : ∅0.6
Soldering iron : 941 made by Hakko
Soldering iron tip : T1-1BC

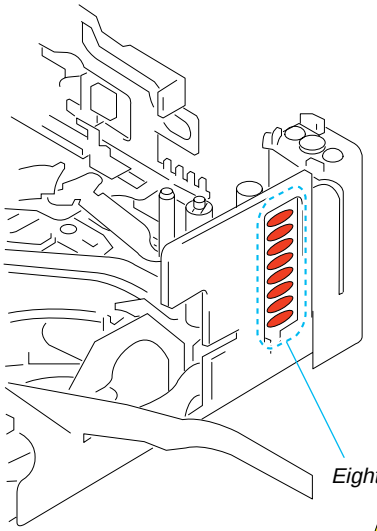
Temperature of the soldering iron tip : 300 ±10 °C
Contacting time of soldering iron tip : within 2 sec



Direction of the terminal is specified.



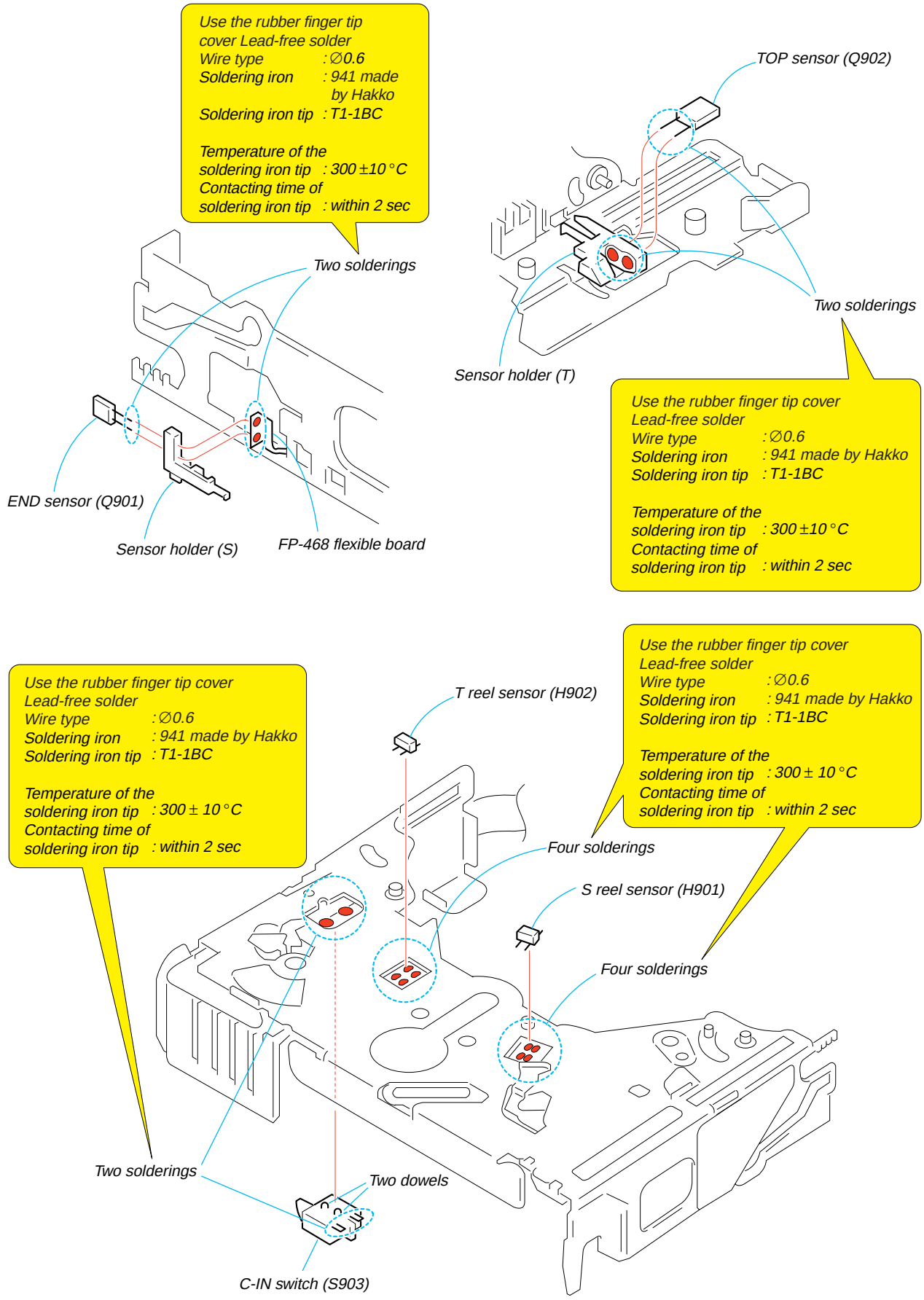
Rubber finger tip protection cover must be used.
Lead-free solder
Wire type: diameter ∅0.6
Soldering iron: 941 made by Hakko
Soldering iron tip: T1-1BC
Temperature of the soldering iron tip: 300 ±10 °C
Contacting time of soldering iron tip: within 2 sec.



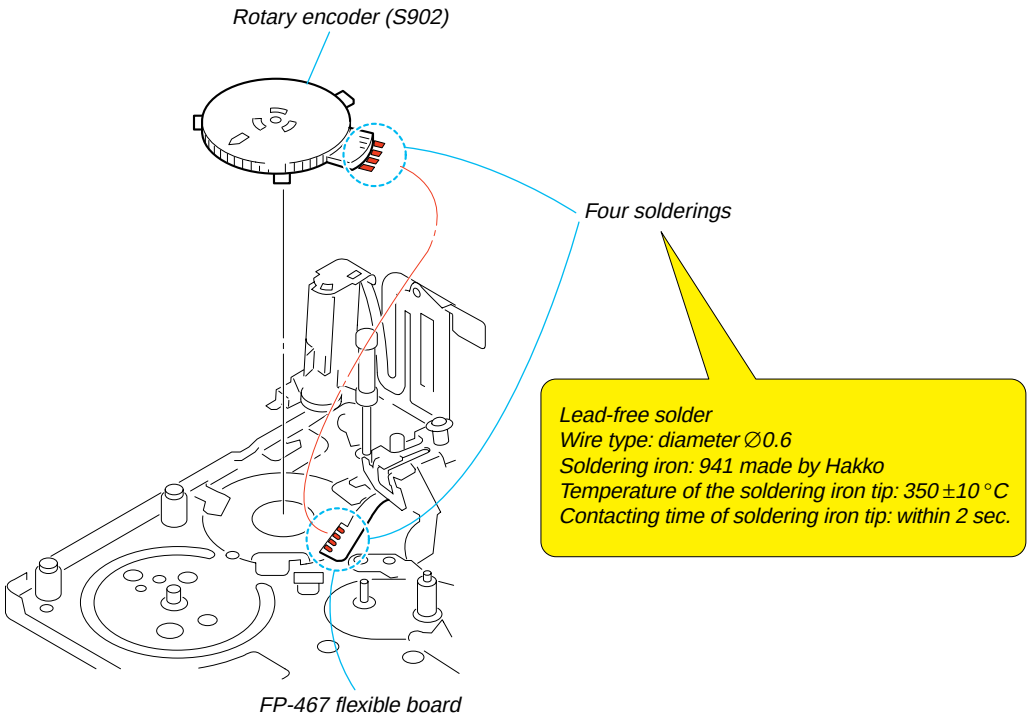
Lead-free solder
Wire type: diameter 0.6 ∅
Temperature of the soldering iron tip: 350 °C
Contacting time of soldering iron tip: within 2 sec.

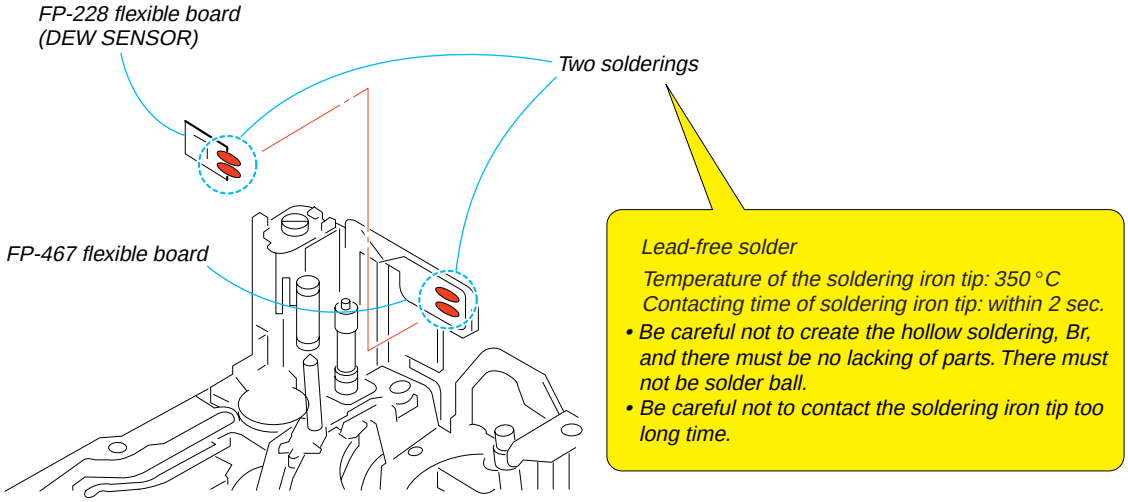
- Be careful not to create the hollow soldering, Br, and there must be no lacking of parts.
- Be careful not to crash the grip jog to the TG1 guide.

Soldering (2)

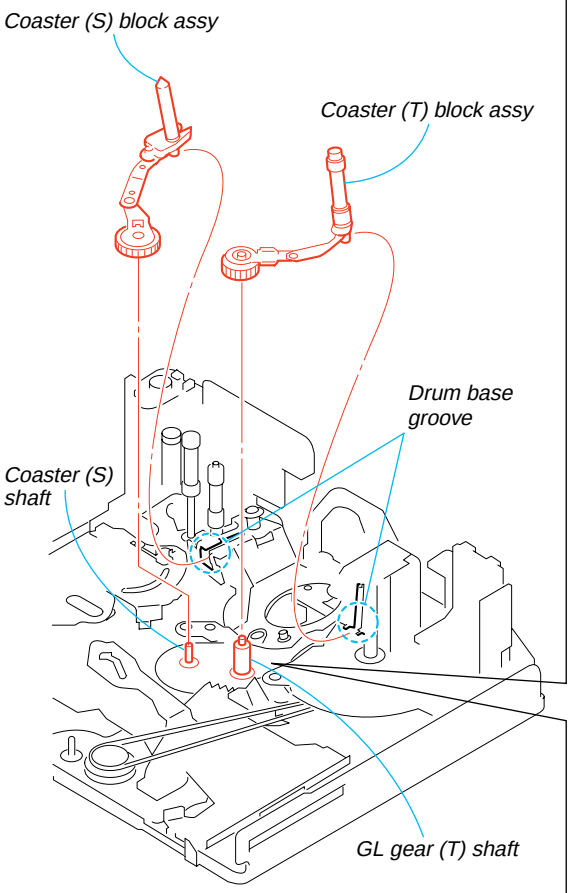

Use the rubber finger tip cover Lead-free solder
Wire type : ∅0.6
Soldering iron : 941 made by Hakko
Soldering iron tip : T1-1BC
Temperature of the soldering iron tip : 300 ±10 °C
Contacting time of soldering iron tip : within 2 sec
Two solderings
END sensor (Q901)
Sensor holder (S)
FP-468 flexible board
TOP sensor (Q902)
Two solderings
Sensor holder (T)
Use the rubber finger tip cover Lead-free solder
Wire type : ∅0.6
Soldering iron : 941 made by Hakko
Soldering iron tip : T1-1BC
Temperature of the soldering iron tip : 300 ±10 °C
Contacting time of soldering iron tip : within 2 sec
Use the rubber finger tip cover Lead-free solder
Wire type : ∅0.6
Soldering iron : 941 made by Hakko
Soldering iron tip : T1-1BC
Temperature of the soldering iron tip : 300 ± 10 °C
Contacting time of soldering iron tip : within 2 sec
T reel sensor (H902)
Four solderings
S reel sensor (H901)
Four solderings
Two solderings
Two dowels
C-IN switch (S903)

Soldering (3)

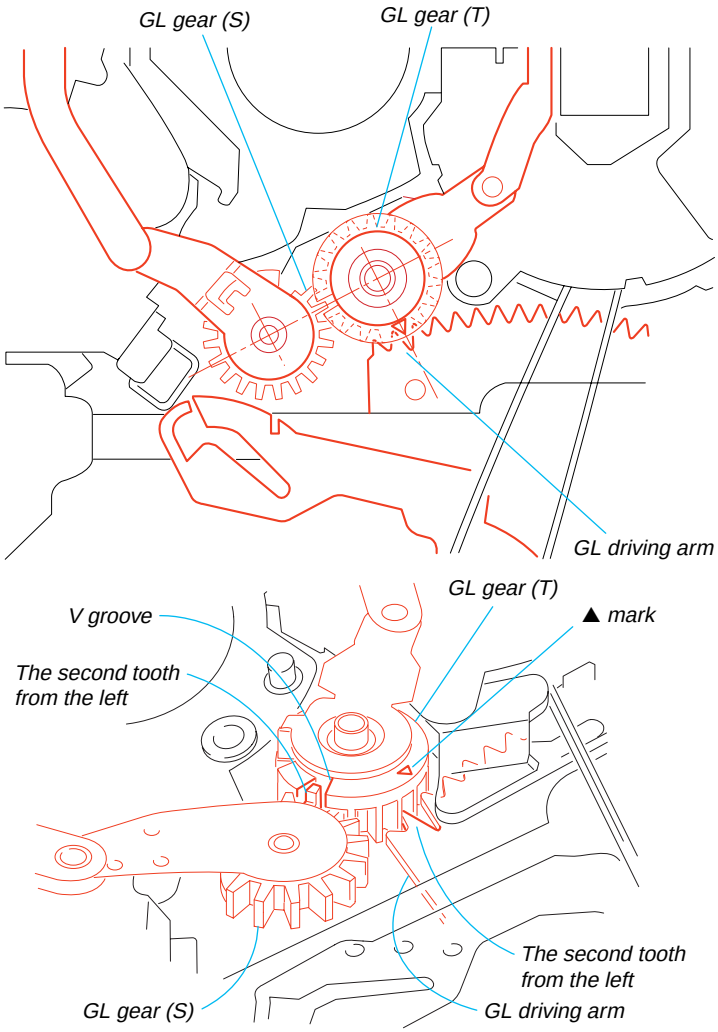

Rotary encoder (S902)
Four solderings
Lead-free solder
Wire type: diameter ∅0.6
Soldering iron: 941 made by Hakko
Temperature of the soldering iron tip: 350 ±10 °C
Contacting time of soldering iron tip: within 2 sec.
FP-467 flexible board


FP-228 flexible board
(DEW SENSOR)
Two solderings
FP-467 flexible board
Lead-free solder
Temperature of the soldering iron tip: 350 °C
Contacting time of soldering iron tip: within 2 sec.
• Be careful not to create the hollow soldering, Br, and there must be no lacking of parts. There must not be solder ball.
• Be careful not to contact the soldering iron tip too long time.

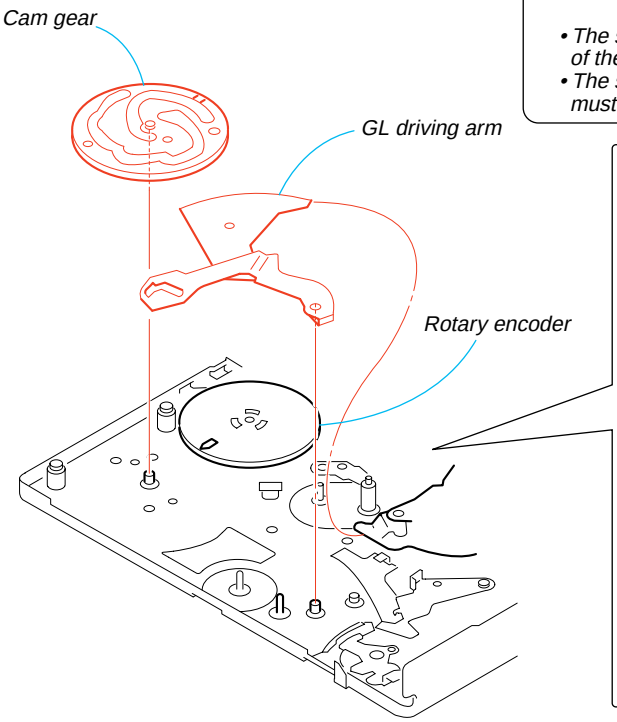
Matching Phase

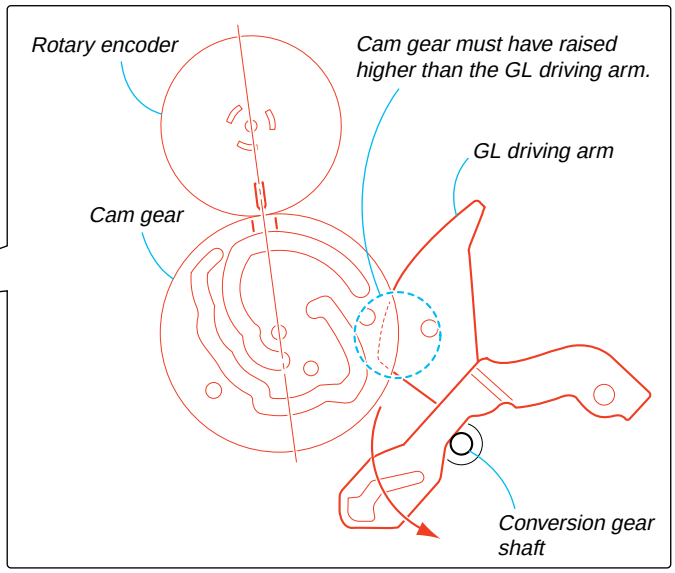


When re-assembling, adjust the gear phase at the three positions.



- The second tooth from the left of the GL gear (S) and the V-groove of the GL gear (T) must be in phase.
- The second tooth from the left of the GL drive arm and the ▲ mark must be in phase.





4. Adjustment

4-1. FWD Position Adjustment

When the TG2 arm block assy or the band adjuster or the S reel table assy is replaced or removed, the following adjustment becomes necessary.

- TG2 FWD Position Adjustment (Refer to section 4-4.)
- FWD Back Tension Adjustment (Refer to section 4-4.)
- Reel Table (RVS) Check (Refer to section 4-2.)

1) Set the R/P mode and check the TG2 guide position as follows.
   - Confirm that the distance between the TG2 guide and the L motor is 1.0 mm. If not, perform adjustment as follows.
2) Loosen the fixing screw. Use the adjustment screwdriver (Ref No. J-8) and adjust the band adjuster for the distance of 1.0 mm between the TG2 guide and the L motor. Upon completion of adjustment, tighten the fixing screw securely as follows.
   Tightening torque: 0.059 ± 0.01 N•m (0.6 ± 0.1 kgf•cm)
   Note: Upon completion of adjustment, confirm that TG2 can move with some margin in the direction of the arrow Ⓐ.

4-2. Reel Torque Check

1. Check Procedure

[FWD torque]

1) Set the mini DV torque cassette (Ref. No. J-6).
2) Establish the FWD mode. Confirm that the center value of the T reel table torque value is in the range of 0.49 to 0.93 (mN•m) (5.0 to 9.5 g•cm) within deviation of 0.39 (mN•m) (4.0 g•cm)

[RVS torque]

1) Set the mini DV torque cassette (Ref. No. J-6).
2) Establish the RVS mode. Confirm that the center value of the S reel table torque value is in the range of 1.57 to 2.45 (mN•m) (16.0 to 25.0 g•cm)

If the above specification is not satisfied, check the tension regulator band for correct operation. If operation of the tension regulator band has no problem, replace the respective reel tables.

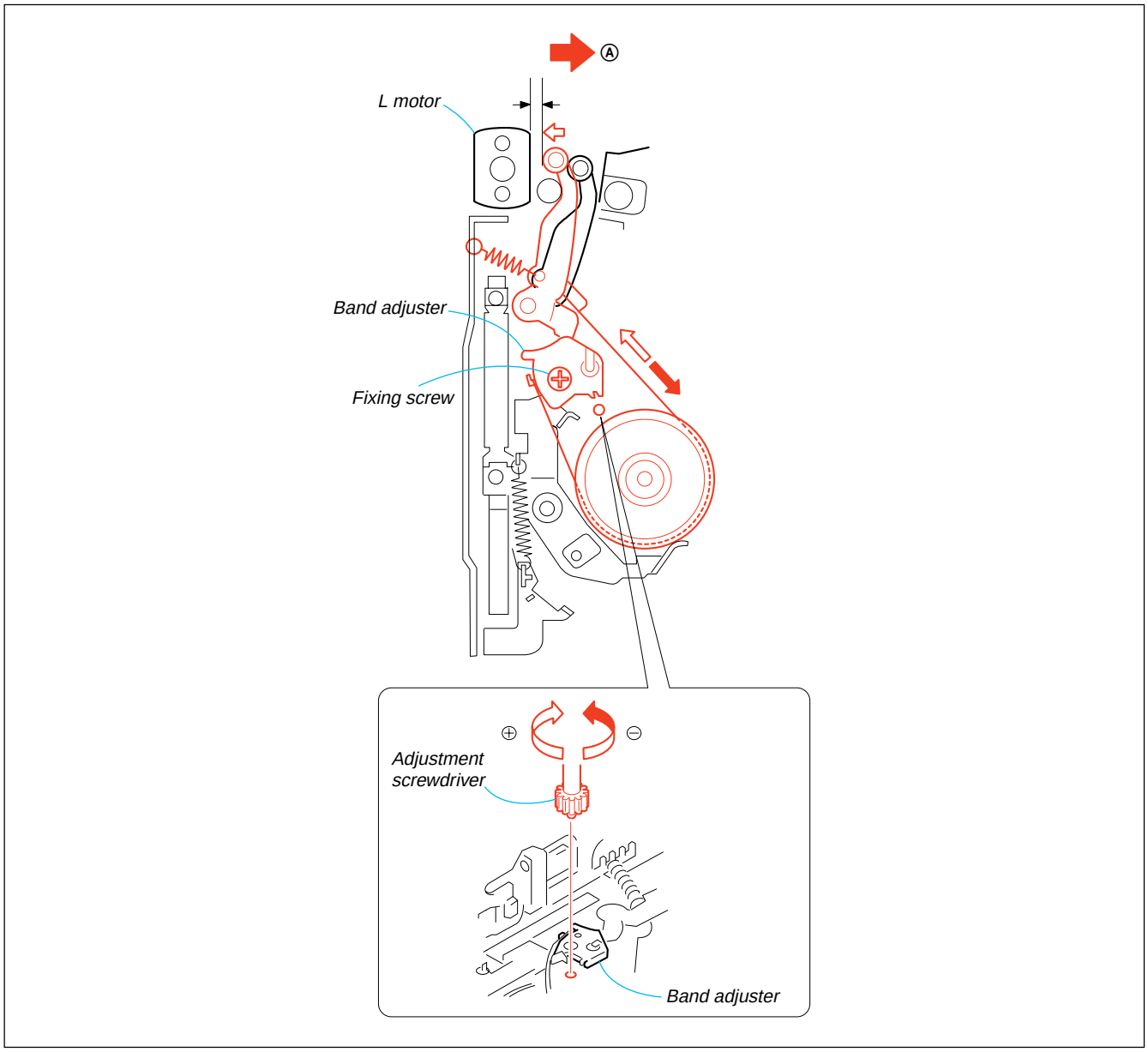


Fig. 4-1

4-3. LS Cam Plate Position Adjustment

1. Adjustment Procedure

1) Loosen the LS cam plate fixing screw (special head screw M1.4 × 1.4) by 180 degrees.
2) Set the STOP mode.
3) While pressing the center of the LS chassis block with the force of 1.5 ± 0.5 N (150 gf ± 50 gf), move the LS cam plate toward the S reel side with the force of 0.147 ± 0.01 N•m (2300 gf ± 200 gf) and tighten the LS cam plate fixing screw (special head screw M1.4 × 1.4) ①.
   Tightening torque: 0.098 ± 0.01 N•m (1.0 ± 0.1 kgf•cm)

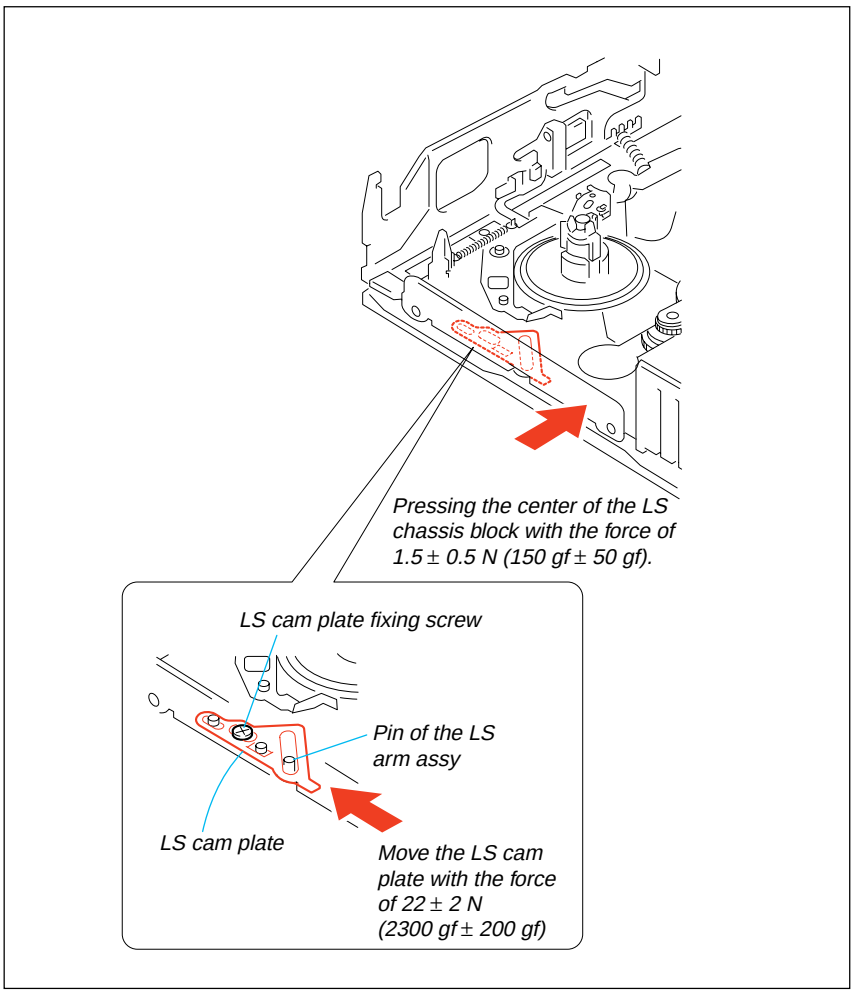

Pressing the center of the LS chassis block with the force of 1.5 ± 0.5 N (150 gf ± 50 gf).
LS cam plate fixing screw
Pin of the LS arm assy
LS cam plate
Move the LS cam plate with the force of 22 ± 2 N (2300 gf ± 200 gf)

Fig. 4-2

4-4. Tape Path Adjustment

4-1. Adjustment Preparation

1) Clean the tape running surface (tape guides, drum, capstan, pinch roller) referring to section 2-2.
2) Connect the adjustment remote commander (Ref. No. J-13) to the LANC terminal of the machine. Set the HOLD switch to ON.
3) Connect an oscilloscope to CN1004 of the VC-312 board via the CPC-7 jig (J-6082-382-A). (In the case of DCR-TRV22K)
   Oscilloscope CH1: VC-312 board CN1004 pin② (Note 1)
   EXT. TRIG: VC-312 board CN1004 pin④
   Note 1: Connect CN1004 pin② and pin⑥ (GND) with a 75-ohm resistor (1-247-804-11).
4) Play back the tracking alignment tape (XH 2-1) (Ref. No. J-5).
5) Select page: 0, address: 10 and set data: 00. (Note 2)
6) Select page: 3, address: 26 and set data: 31, and press the PAUSE button. (Note 2)
7) Select page: 3, address: 33 and set data: 08. (Note 2)
8) Confirm that the RF waveform on the scope is flat at both of the entrance side and the exit side. (Refer to Fig. 4-4A.)
   If the RF waveform is not flat either at the entrance side or the exit side (refer to Fig. 4-4 B and C), perform the adjustment of section 6-2 and later.
9) When the required conditions of step 8) are satisfied, perform [Required Work upon Completion of Adjustment] as described below upon completion of adjustment/check.

[Required Work upon Completion of Adjustment]

1) Connect the adjustment remote commander (Ref. No. J-13) to the LANC terminal of the machine. Set the HOLD switch to ON.
2) Select page: 0, address: 10 and set data: 00. (Note 2)
3) Select page: 3, address: 26 and set data: 00, and press the PAUSE button. (Note 2)
4) Select page: 3, address: 33 and set data: 00. (Note 2)
   Note 2: Page and address numbers differ depending on each model. Please to Service Manual of the respective models. Page and address numbers of DCR-TRV22K are shown in this manual.

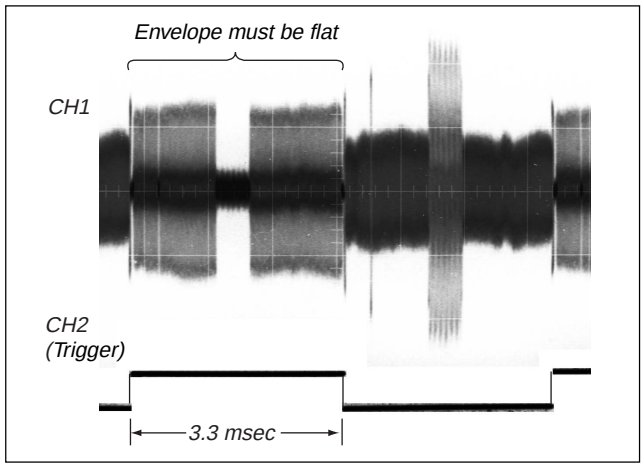


Fig. 4-3

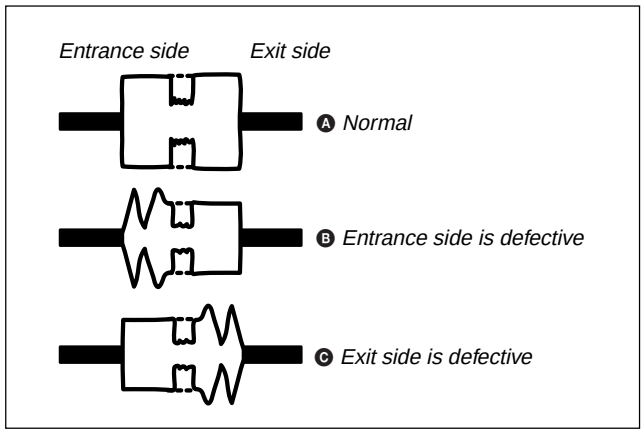


Fig. 4-4

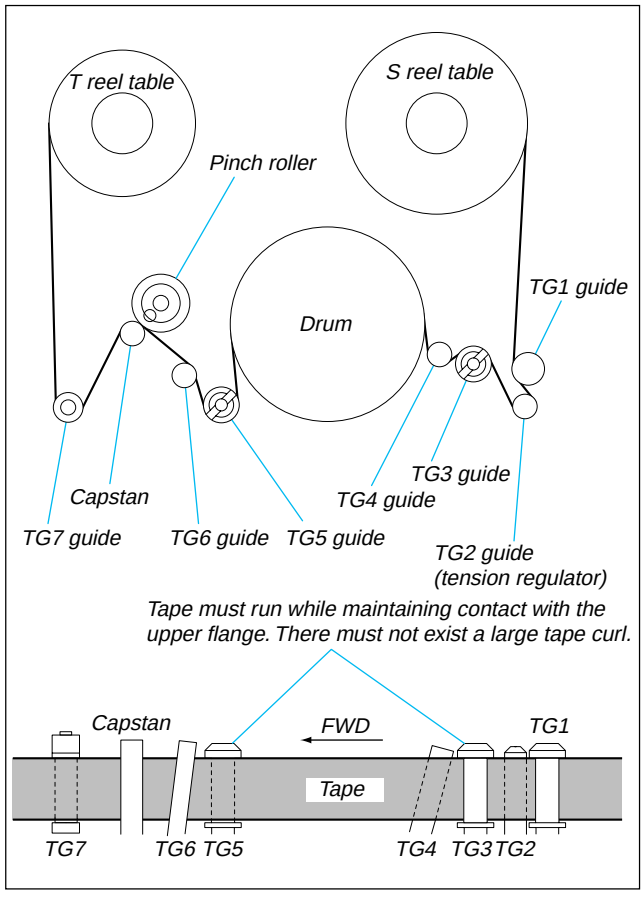


Fig. 4-5

4-2. TG3/TG5 Guide Coarse Adjustment

1) Play back the tracking alignment tape (XH 2-1) (Ref. No. J-5).
2) Adjust the TG3 and TG5 guides until the RF envelope waveform becomes flat. (Refer to Fig. 4-8.)

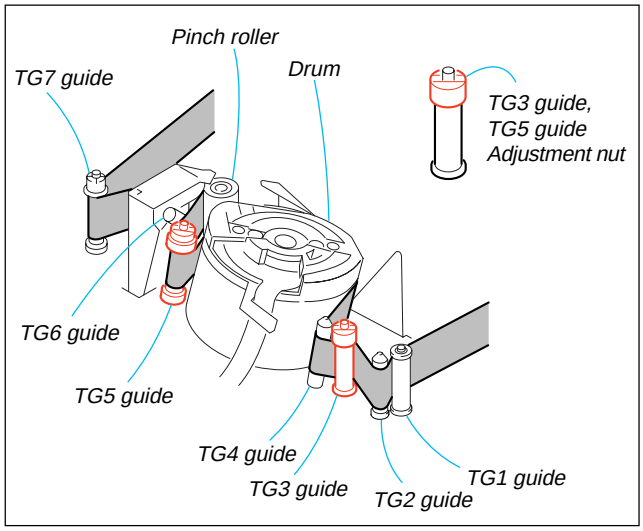


Fig. 4-6

4-3. FWD Back Tension Adjustment

1) Set the mini DV torque cassette (Ref. No. J-6) and establish the FWD mode.
2) Confirm that the S side torque cassette reading value is in the range of 0.2 to 0.3 mN•m (2.0 to 3.0 g•cm) including deviation. If the measurement value does not satisfy the specifications, perform the following adjustment.
   - If the measurement value is higher than the specification: (Decreases the spring tension)
     Move the tension coil spring hook to another spring stay in the direction of Ⓑ.
   - If the measurement value is lower than the specification: (Increases the spring tension)
     Move the tension coil spring hook to another spring stay in the direction of Ⓐ.

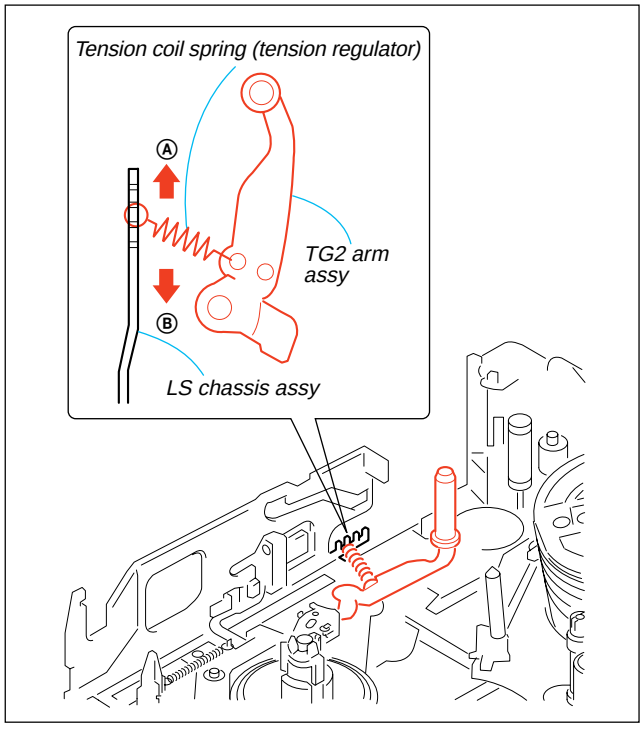


Fig. 4-7

4-4. TG3/TG5 Guide Fine Adjustment

1) Play back the tracking alignment tape (XH 2-1) (Ref. No. J-5).
2) Adjust the TG3 so that the RF envelope has the larger amplitude at the entrance side first, than adjust TG3 guide for flat amplitude. (Refer to Fig. 4-8.)
3) Adjust the TG5 so that the RF envelope has the larger amplitude at the exit side first, than adjust TG5 guide for flat amplitude. (Refer to Fig. 4-9.)

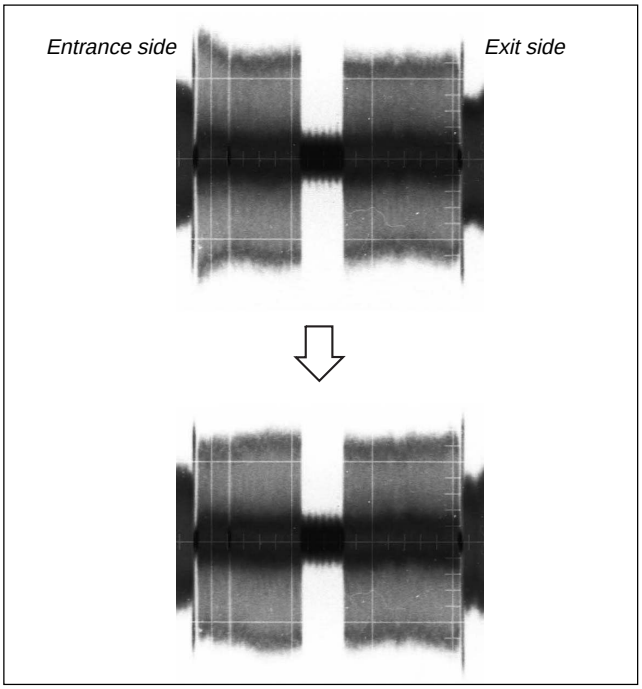


Fig. 4-8

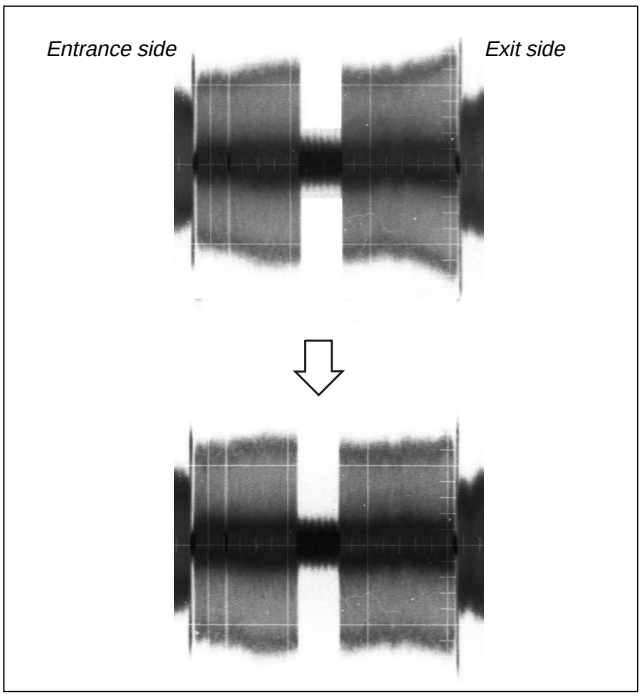


Fig. 4-9

4-5. Tape Run Check

1) Play back the tracking alignment tape (XH 2-1) (Ref. No. J-5). Establish the CUE mode first then the REV mode. Confirm in the respective modes that there are no large tape curls at the upper flange of TG3 and TG5. Then confirm in the respective modes that there are no large tape curls at the upper and lower flanges of TG1 and TG7.

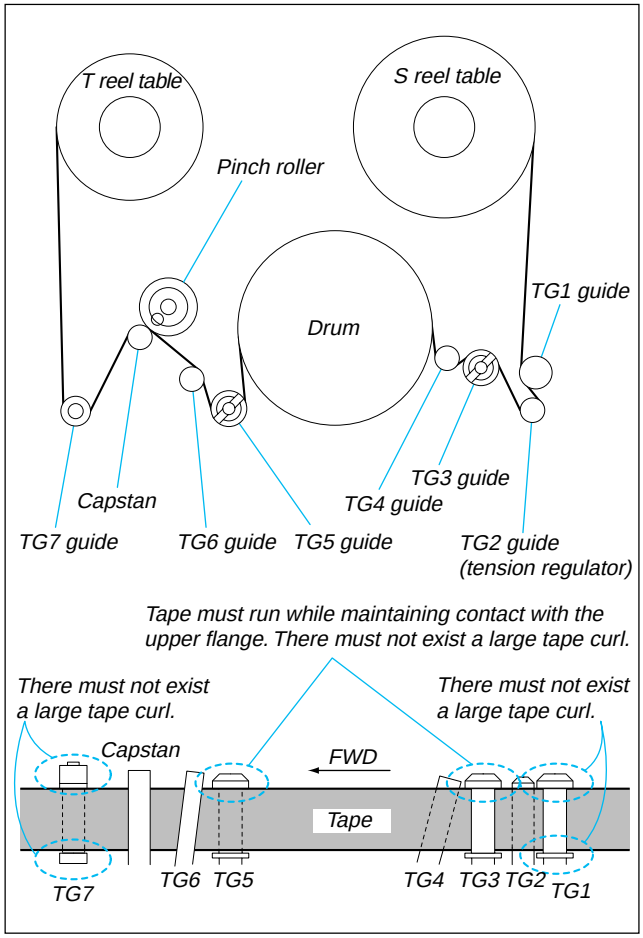


Fig. 4-10

4-6. Check upon Completion of Adjustment

1. Tracking Check

1) Play back the tracking alignment tape (XH 2-1) (Ref. No. J-5).
2) Establish the CUE (or REV) mode. Take the amplitude (A) in this mode as the 100% waveform amplitude. (Refer to Fig. 4-11.)
3) Establish the FWD mode. Confirm that the difference between the minimum (E min) and the maximum (E max) is less than 30%. (When taking the amplitude (A) in the CUE or REV mode as 100%)

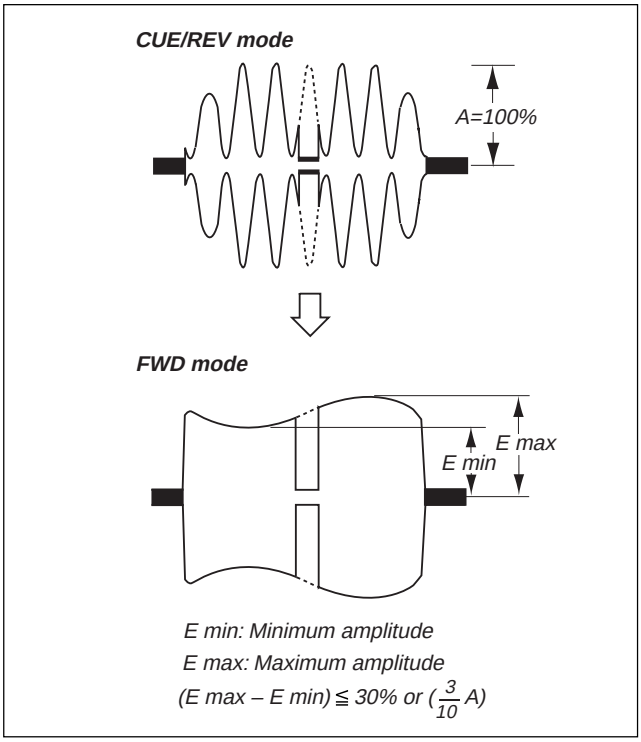


Fig. 4-11

4) Confirm that the RF waveform does not have excessive fluctuation of amplitude. (Fluctuation of amplitude should be 10% or less at both entrance side (B) and exit side (C), when taking the amplitude (A) in the CUE or REV mode as 100%)

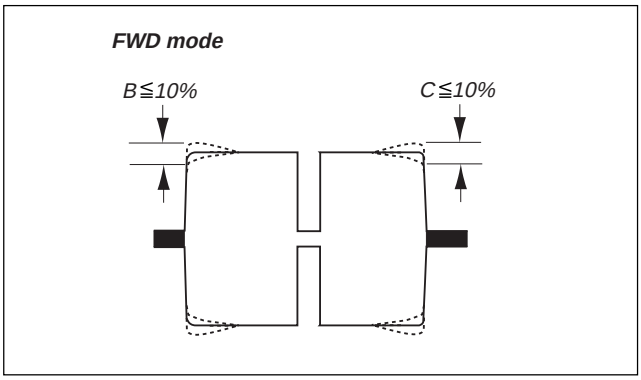


Fig. 4-12

2. CUE/REV Check

1) Play back the tracking alignment tape (XH 2-1) (Ref. No. J-5).
2) Establish the CUE mode. Confirm that the pitches between the peaks of the RF waveform are equally spaced. Also confirm that the RF waveform amplitude at entrance side (B) and exit side (C) is 50% or more respectively, when taking the amplitude (A) in the CUE or REV mode as 100%.
3) Establish the REV mode. Confirm that the pitches between the peaks of the RF waveform are equally spaced. Also confirm that the RF waveform amplitude at entrance side (B) and exit side (C) is 50% or more respectively.

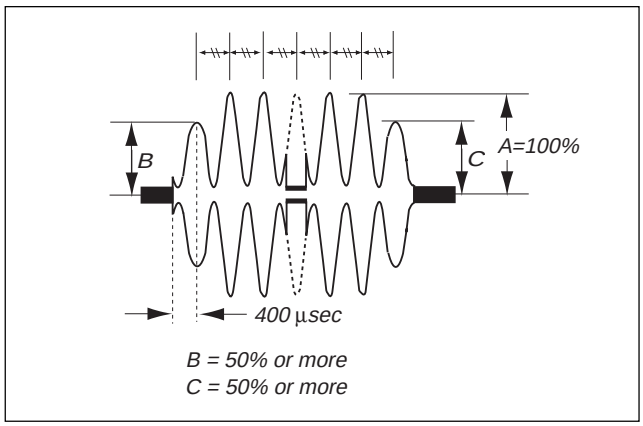


Fig. 4-13

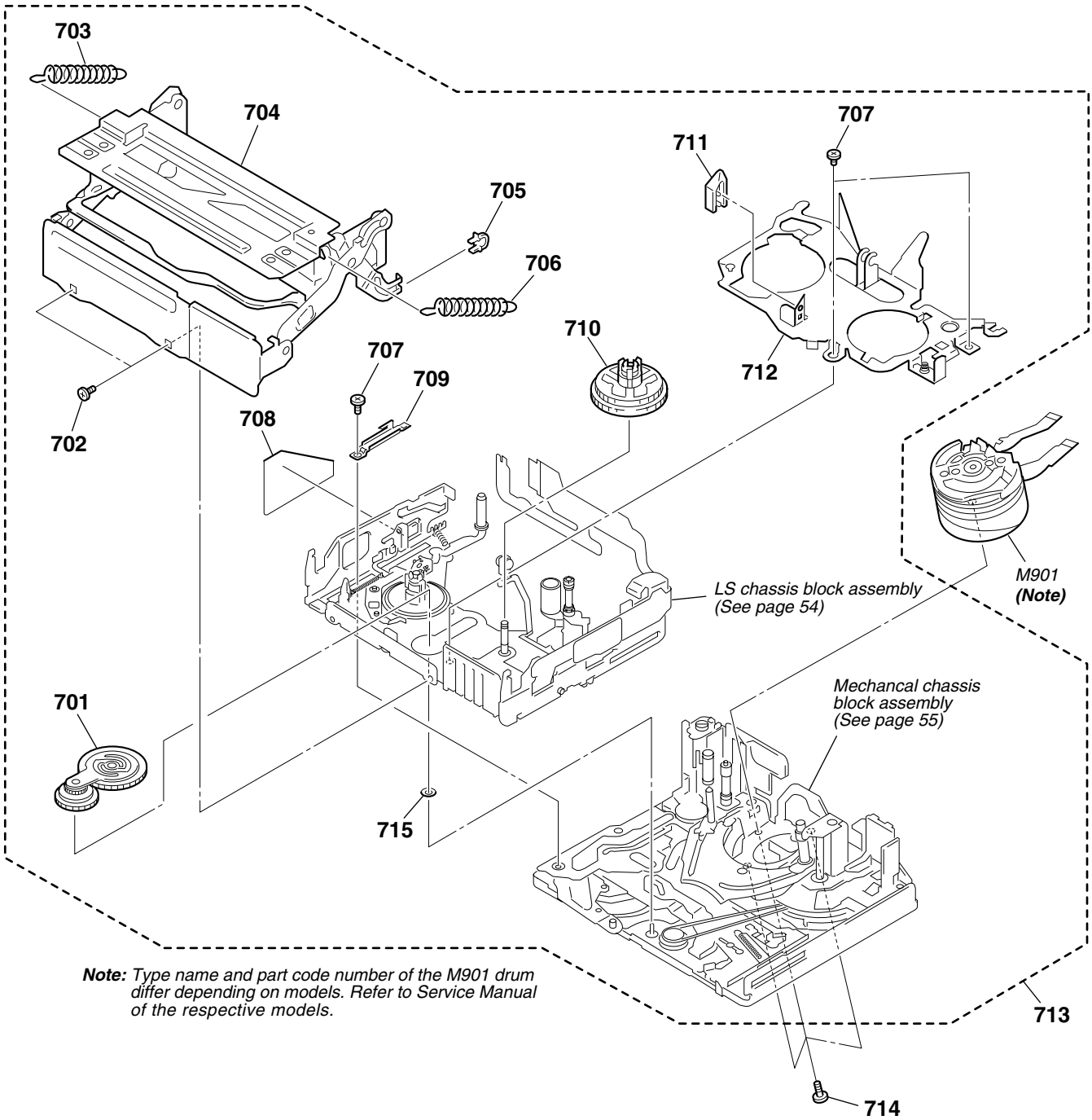
3. Rise-up Check

1) Play back the tracking alignment tape (XH 2-1) (Ref. No. J-5).
2) Change the modes from CUE mode to FWD. Confirm that the RF waveform rises up within two seconds when the mode is changed from CUE mode to FWD.
3) Change the modes from REV mode (two seconds or more of REV and to the FWD within five seconds) to FWD. Confirm that the RF waveform rises up within two seconds when the mode is changed from REV mode to FWD.
4) Change the modes from STOP mode to FWD. Confirm that the RF waveform rises up within two seconds when the mode is changed from STOP mode to FWD.

5. Exploded Views

NOTE:
- -XX, -X mean standardized parts, so they may have some differences from the original one.
- Items marked "*" are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.
- The mechanical parts with no reference number in the exploded views are not supplied.

5-1. Overall Mechanism Deck Section (Z100)

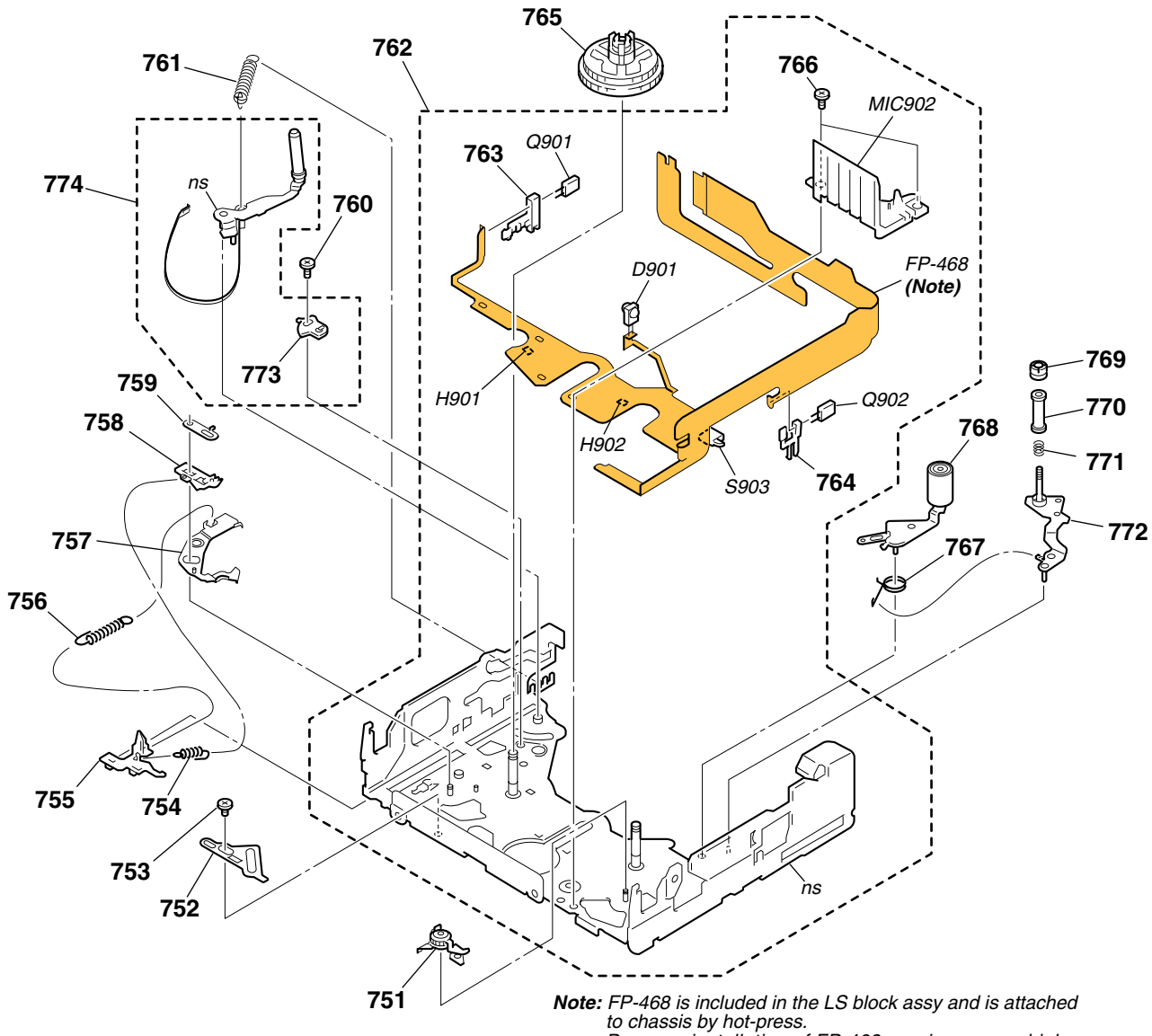


Note: *Type name and part code number of the M901 drum differ depending on models. Refer to Service Manual of the respective models.*

Ref. No.	Part No.	Description
701	X-3952-938-3	GEAR ASSY, GOOSENECK
702	3-075-097-11	SCREW (M1.4X1.4), SPECIAL HEAD
703	3-079-206-02	SPRING (POP UP S), EXTENSION
704	X-3952-939-3	COMPARTMENT ASSY, CASSETTE
705	3-079-367-01	DAMPER, CASSETTE COMPARTMENT
706	3-079-215-02	SPRING (POP UP T), EXTENSION
707	3-703-816-15	SCREW (M1.4), SPECIAL HEAD
708	3-080-545-01	COVER, SENSOR S
709	3-079-364-01	RETAINER, LS GUIDE
710	X-3952-937-1	TABLE ASSY, T REEL
711	3-079-366-01	RELEASE, REEL LOCK
712	X-3953-257-1	PLATE ASSY, RETAINER
713	A-7095-393-A	MD (Z100) SUB ASSY
714	3-079-741-02	SCREW,DRUM FIXING
715	3-748-682-01	WASHER,T
M901	– Note –	DRUM (DEH-30A-R)(SERVICE)

5-2. LS Chassis Block Assembly

ns : not supplied



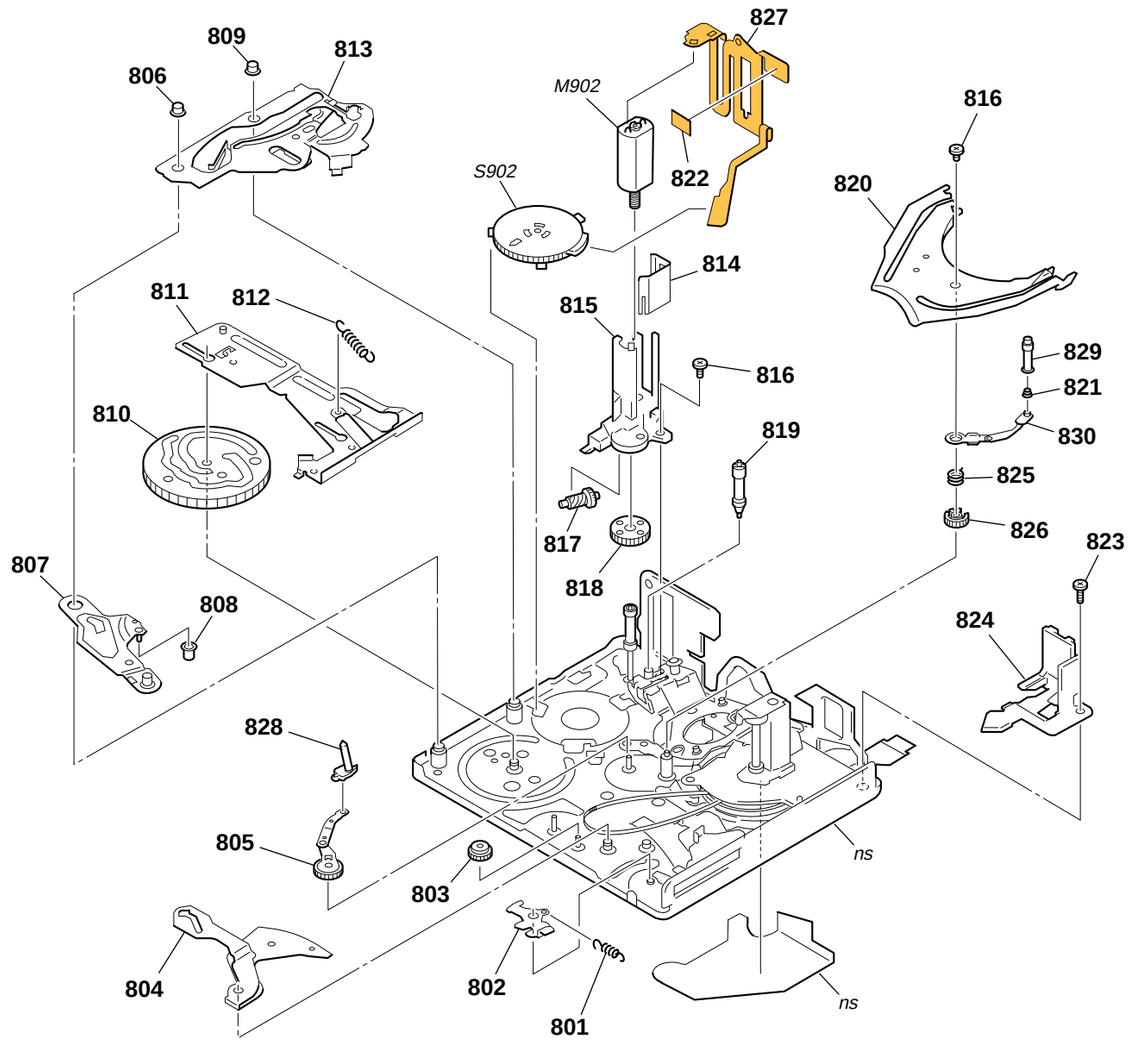
Note: *FP-468 is included in the LS block assy and is attached to chassis by hot-press.*
Because installation of FP-468 requires a very high accuracy, FP-468 is not supplied as an independent service parts.

Ref. No.	Part No.	Description
751	A-7095-402-B	BRAKE (T) BLOCK ASSY
752	3-079-241-01	PLATE, LS CAM
753	3-075-097-11	SCREW (M1.4X1.4), SPECIAL HEAD
754	3-079-246-01	SPRING (RELEASE RACK),EXTENSION
755	3-079-248-01	POSITIONING (S), CASSETTE
756	3-079-244-01	SPRING (ULE), EXTENSION
757	X-3952-932-1	BRAKE ASSY, ULE
758	3-079-245-01	RACK (S), RELEASE
759	3-079-247-01	BRAKE (S)
760	3-059-090-11	SCREW (M1.4X2.5), SPECIAL HEAD
761	3-079-242-01	SPRING, TENSION (TENSION REGULATOR)
762	A-7095-401-A	LS BLOCK ASSY
763	3-079-267-01	HOLDER (S), SENSOR
764	3-079-268-01	HOLDER (T), SENSOR
765	X-3952-936-2	TABLE ASSY, S REEL

Ref. No.	Part No.	Description
766	3-703-816-15	SCREW (M1.4), SPECIAL HEAD
767	3-079-243-01	SPRING (PINCH RETURN), TORSION
768	X-3952-934-1	ARM ASSY, PINCH
769	3-052-062-02	NUT, TG7
770	3-079-219-02	TG7
771	3-081-591-01	SPRING, COMPRESSION (TG7)
772	X-3952-935-3	ARM ASSY, TG7
773	3-079-237-01	ADJUSTOR, BAND
774	A-7095-403-B	TG2 ARM BLOCK ASSY
D901	6-500-471-01	DIODE GL453E00000F (TAPE LED)
H901	8-719-067-74	ELEMENT, HOLE HW-105A-CDE-T (S REEL)
H902	8-719-067-74	ELEMENT, HOLE HW-105A-CDE-T (T REEL)
MIC902	1-817-175-12	PIN, CONNECTOR (WITH DETECTION SWITCH)
S903	1-529-566-51	SWITCH, PUSH (1 KEY) (C.C. DOWN)
Q901	6-550-402-01	TRANSISTOR PT4850FE000F (TAPE END)
Q902	6-550-402-01	TRANSISTOR PT4850FE000F (TAPE TOP)

5-3. Mechanical Chassis Block Assembly

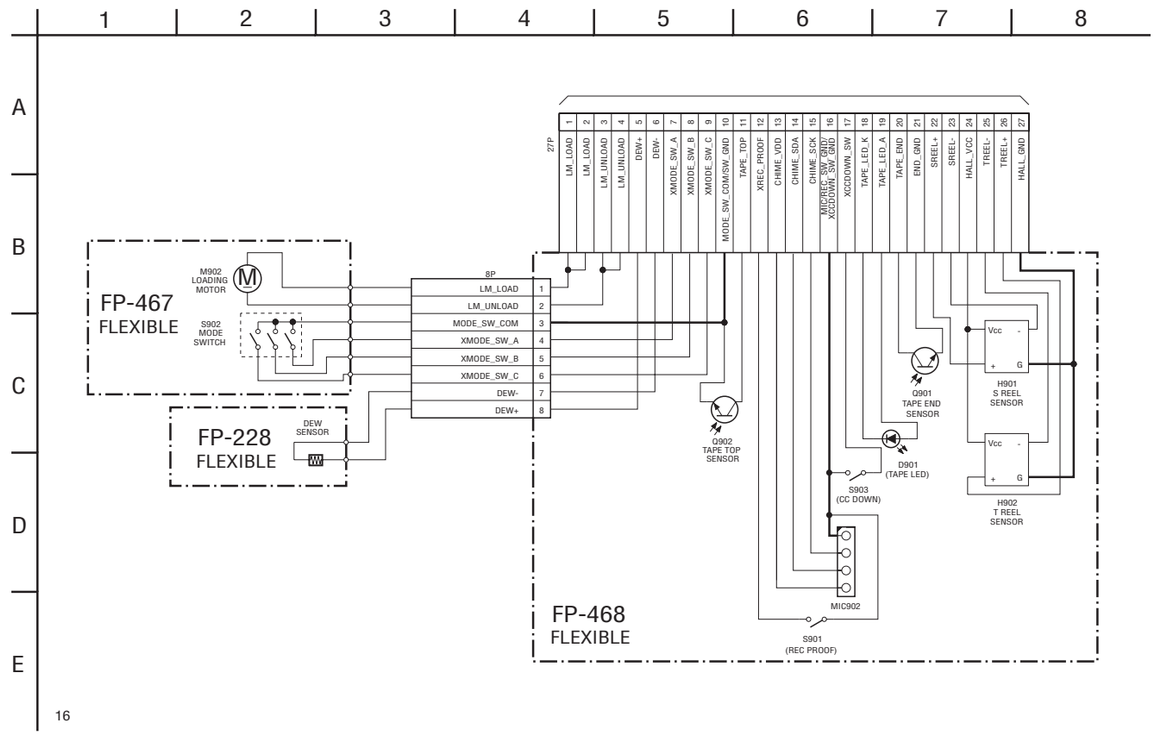
ns : not supplied



Ref. No.	Part No.	Description
801	3-079-314-01	SPRING (EJ), EXTENSION
802	3-079-327-01	ARM, EJ
803	3-079-323-02	GEAR, CONVERSION
804	3-079-324-02	ARM, GL DRIVING
805	X-3952-928-1	GL (S) ASSY
806	3-079-315-01	ROLLER (S1), LS GUIDE
807	X-3952-925-1	ARM ASSY, LS
808	3-079-320-01	ROLLER, LS
809	3-079-316-01	ROLLER (S2), LS GUIDE
810	3-079-319-01	GEAR, CAM
811	X-3952-941-1	SLIDER ASSY, M
812	3-079-321-02	SPRING (PINCH), EXTENSION
813	X-3952-940-2	PLATE ASSY, TG2 CAM
814	3-079-312-01	SHIELD, MOTOR
815	3-079-307-01	HOLDER, MOTOR
816	3-703-816-15	SCREW (M1.4), SPECIAL HEAD

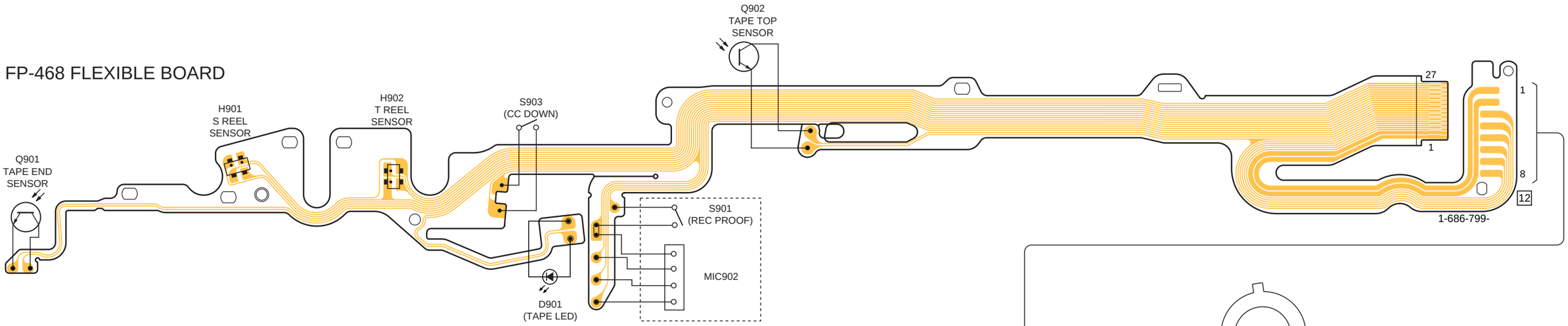
Ref. No.	Part No.	Description
817	3-079-308-01	SHAFT, WORM
818	3-079-309-01	GEAR, DECELERATION
819	X-3952-942-2	ROLLER ASSY, TG3
820	3-079-325-01	RAIL, GUIDE
821	3-079-295-02	SPRING, TG5
822	1-677-049-11	FP-228 FLEXIBLE BOARD (DEW SENSOR)
823	3-079-328-01	SCREW ,SPECIAL (EG GRIP)
824	3-079-326-02	SUPPORT, TG7
825	3-079-301-01	SPRING (GLT), TORSION
826	3-079-298-01	GEAR (T), GL
827	1-686-798-11	FP-467 FLEXIBLE BOARD
828	X-3952-927-2	COASTER (S) ASSY
829	X-3952-930-3	ROLLER ASSY, TG5
830	X-3952-929-3	COASTER (T) ASSY
M902	A-7095-396-A	MOTOR BLOCK ASSY, L (LOADING)
S902	1-477-679-11	ROTARY, ENCODER (SWITCH)

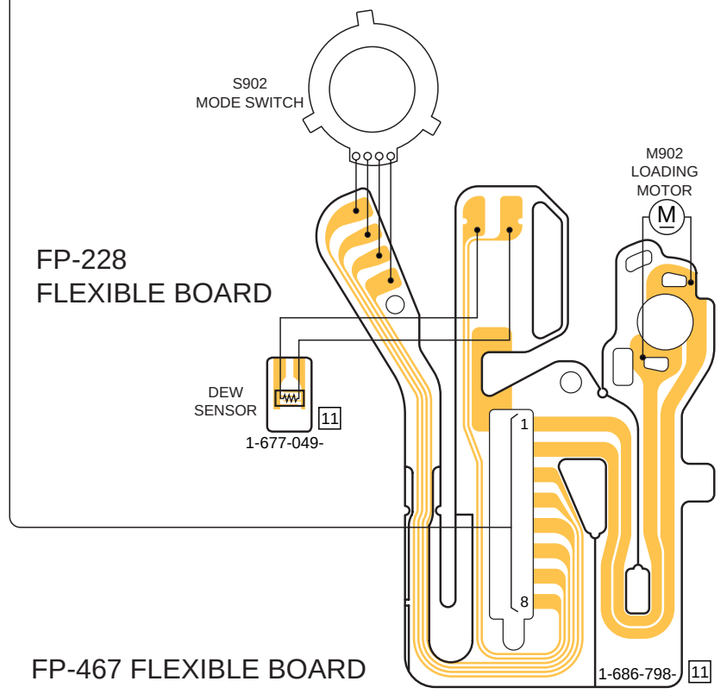
6. Schematic Diagrams



16

7. Printed Wiring Boards





2003A1600-1
©2003.1
Published by DI Customer Center

Revision History

Ver.	Date	History	Contents	S.M. Rev. issued
1.0	2003.01	Official Release	—	—